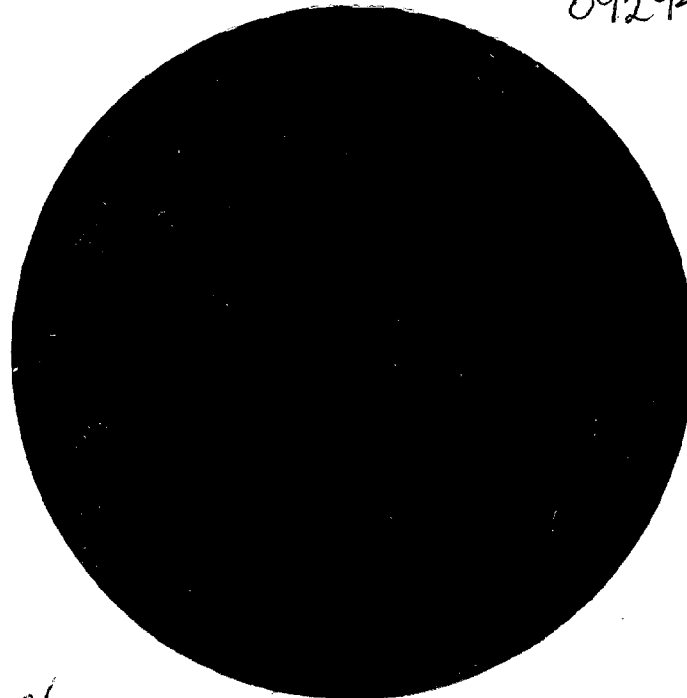


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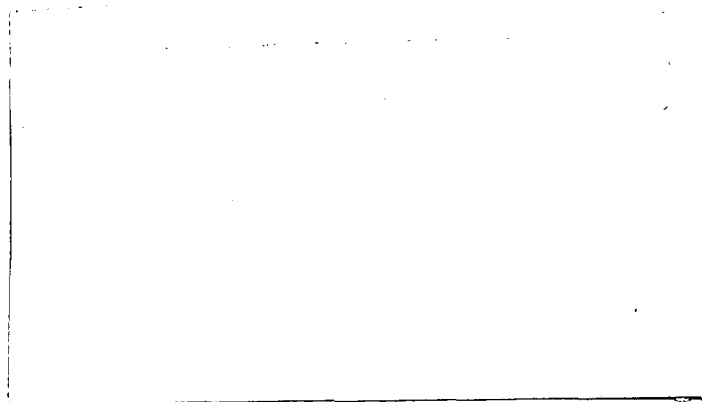
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**COASTAL ZONE
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ECONOMIC AND SOCIAL INVENTORY

TECHNICAL REPORT 102

PART 1

PREPARED BY:

NORTHWESTERN INDIANA REGIONAL PLANNING COMMISSION

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INDIANA COASTAL ZONE MANAGEMENT PROGRAM

ECONOMIC AND SOCIAL INVENTORY

TECHNICAL REPORT 102
PART 1

SEPTEMBER, 1976

PREPARED FOR:

INDIANA STATE PLANNING SERVICES AGENCY
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INTRODUCTION

Lake Michigan forms the northern boundary for Lake and Porter Counties and the State of Indiana. The 33 miles of shoreline is shared by the nation's largest steel-making complex, power-generating plants, a major shipping port, private homeowners, and the Dunes State and National Lakeshore Parks. The potential exists for further development of land in the coastal area. What direction this development should take, how much should be allowed, and what should be preserved as public open space for future generations are the major issues being addressed in the Coastal Zone Management Program. A methodology for resolving these issues is the major goal.

The first step in meeting this goal is an in-depth study of the social, physical, economic and environmental characteristics of the coastal area. The coastal area in northwestern Indiana is temporarily defined as being the Lake Michigan drainage basin, which includes the northern half of Lake and Porter Counties. This covers the Lake County townships of Calumet, Center, Hobart, North, Ross, and St. John. Porter County townships in the drainage basin are Center, Jackson, Liberty, Pine, Portage, Union and Westchester.

This report provides the basic data necessary to begin designing a management program that will direct the future uses and prevent abuses of Indiana's coastal zone.

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POPULATION

Population Trends

The population of northwestern Indiana has increased from 408,228 in 1950 to 573,548 in 1960 to 633,367 in 1970. This represents a growth rate of 40.5 percent for the period 1950-60 and 10.4 percent for the period 1960-70. As these figures show, although the actual numbers have increased, the rate of growth has significantly declined over the past 20 years. The State of Indiana shows a similar decline in growth, from an 18.59 percent increase between 1950-1960 to only an 11.49 percent increase in population during the 1960-1970 decade.

A comparison of the Lake County and Porter County growth trends shows that while Lake County continues to far exceed Porter County in actual population, Porter County has maintained a significantly greater rate of growth.

Lake County's population increased 39.4 percent during the period 1950-1960 but only 6.4 percent during the period 1960-1970. Porter County's population, however, increased 50.4 percent between 1950-1960 and 44.5 percent between 1960-1970. In actual numbers, Lake County's population growth for the 1950-1960 period was 145,117 and for the 1960-1970 period, 32,984. Porter County increased its population between 1950 and 1960 by 20,203 and by 26,835 between 1960 and 1970.

A detailed description of the growth rates in individual Lake County and Porter County communities shows that the greatest growth has occurred in the suburban communities of Lake County and nearly all Porter County com-

munities, most of which are within the Coastal Zone Management study area. The greatest rates of growth during the period 1960-1970 occurred in Griffith, Highland, Munster, Lowell, St. John and Portage. East Chicago, Gary, Hammond, New Chicago and Whiting each declined in population between 1960 and 1970.

Although the growth trends favor Porter County and suburban Lake County, the central cities of East Chicago, Hammond and Gary continue to represent the most densely populated area within the two counties. These three cities, with a combined 1970 population of 330,187, constitute slightly more than 52 percent of the region's total population. The combined Coastal Zone Townships account for more than 90 percent of the region's population. Table 1a compares the rates of growth in the Gary-Hammond SMSA with comparable figures for the State of Indiana and individual communities in Lake and Porter Counties. Appendix A contains historical population figures for 1900-1970 for the State, SMSA and CZM Townships.

Estimates prepared by the Indiana State Board of Health indicate that the region experienced a net out-migration of 25,509 between 1960 and 1970. By County, the estimates are a net out-migration in Lake County of 42,533, and a net in-migration in Porter County of 17,024. Because Lake County experienced a total population gain of 32,984, this can be accounted for only by a natural increase of 75,517. Porter County experienced a net in-migration of 17,024, and a natural increase of 9,811. In comparing these figures with those of earlier periods, it can be seen that Lake County's migration pattern reversed, and its natural increase slowed, while both Porter County's natural increase and in-migration continued to increase.

TABLE 1a: POPULATION GROWTH COMPARISONS

	1950	1960	Percent Change	1970	Percent Change
State of Indiana	3,934,224	4,662,498	18.5	5,193,669	11.4
SMSA	408,228	573,548	40.5	663,367	10.4
<u>Lake County</u>	368,152	513,269	39.4	546,253	6.4
Crown Point ^b	5,839	8,443	44.6	12,037	42.6
Dyer	1,556	3,993	155.6	4,906	22.9
East Chicago	54,263	57,669	6.3	46,982	-18.5
East Gary ^b	5,635	9,309	65.2	15,218	63.5
Gary	133,911	178,320	33.2	175,415	- 1.6
Griffith	4,470	9,483	112.1	18,168	91.6
Hammond	87,594	111,698	27.5	107,790	- 3.5
Highland	5,878	16,284	117.0	24,947	53.2
Hobart	10,244	18,680	82.4	21,485	15.0
Lowell	1,621	2,270	40.0	3,839	69.1
Munster	4,753	10,313	117.0	16,514	60.1
New Chicago	921	2,312	151.0	2,231	- 3.5
St. John	684	1,128	64.9	1,757	55.8
Schererville	1,457	2,875	97.3	3,663	27.4
Whiting	9,669	8,137	- 15.8	7,247	-10.9
Merrillville ^c	-----	-----	----	25,978	-----
<u>Porter County</u>	40,076	60,279	50.4	87,114	44.5
Beverly Shores	488	773	58.4	946	22.4
Chesterton	3,175	4,335	36.5	6,177	42.5
Dune Acres	86	238	176.7	301	26.5
Ogden Dunes	429	927	120.7	1,361	43.7
Portage	-----	11,822	----	19,127	61.8
Porter	1,458	2,189	50.1	3,058	39.7
Town of Pines	-----	939	----	1,007	7.2
Valparaiso	12,028	15,227	26.6	20,020	31.5

^bPopulation figures include the 1970 population of areas annexed after 1970 by Crown Point and East Gary.

^cSpecial Census conducted in 1972.

Source: U.S. Department of Commerce, Bureau of the Census, Census of Population and Housing, 1950, 1960, 1970.

Population Characteristics

The median age of northwestern Indiana's residents dropped from 26.6 years in 1960 to 25.6 years in 1970. Comparable figures for the Chicago SMSA and the State of Indiana in 1970 were 28.4 and 27.2 respectively. Hence, the median age of the region is slightly younger than that of surrounding areas. Table 1b provides a summary of the region's age composition in 1950, 1960 and 1970 derived from Census figures.

In 1970, 43 percent of the region's population was under 20 years of age and 7 percent was over 65 years. These percentages closely approximate the comparable figures for 1960, 41 percent and 6 percent, respectively. However, while the percent of the population in the under 20 group has increased in both the 1950-1960 and the 1960-1970 periods, the percent of population under 5 years in the latter period has declined from 13 percent to 9 percent. This decline can likely be attributed to a national trend toward smaller family size.

TABLE 1b : AGE DISTRIBUTION OF NORTHWESTERN
INDIANA'S POPULATION 1950, 1960, 1970

Age Group	1950	% of Total	1960	% of Total	1970	% of Total
Under 5	46,400	11	76,420	13	58,128	9
5 - 14	66,428	16	122,960	21	143,296	23
15 - 19	26,427	7	40,552	7	62,913	10
20 - 24	32,528	8	34,905	6	47,182	7
25 - 34	72,351	18	78,937	14	77,088	12
35 - 44	61,507	15	81,266	14	75,190	12
45 - 64	80,504	20	103,012	18	126,551	20
65 and over	22,083	5	35,496	6	43,019	7
TOTAL	408, 228	100	573,548	99	633,367	100

Sources: U.S. Department of Commerce, Bureau of the Census, Census of Population and Housing, 1950, 1960, 1970.

Since both the under 20 and over 65 age groups have increased as a percent of the population, the percent of population between 20 and 64 has decreased. This decrease is especially centered in the 25-44 age group, which

declined in absolute number by 7,925 from 160,203 in 1960 to 152,278 in 1970. As a result of the decline in the population between the ages of 25 and 44, the percent of the population under 45 declined from 76 percent in the 1960 to 1970 period.

The sex ratio in northwestern Indiana has shifted over the past 20 years from a male majority of 51.2 percent in 1950 to a female majority of 50.8 percent in 1970. This trend has occurred in both counties, although it is slightly more pronounced in Lake County. Expressed as a ratio of males to females, the sex ratio has declined from 1.050 in 1950 to 1.014 in 1960 to 0.967 in 1970. The expected sex ratio of a population is 0.970 which represents the observed frequency of births as adjusted for infant mortality. Deviations from this norm are usually indications of the impact of migration patterns upon the population. The historically high male to female ratio in northwestern Indiana can be attributed to an in-migration of males in search of employment opportunities offered by the industrial development of the region which has occurred since 1900. The 1970 Census indicates that the sex ratio in the region has attained a balance level.

Table 1c provides a summary of the male-female population in northwestern Indiana in 1950, 1960 and 1970.

TABLE 1c : SEX COMPOSITION OF NORTHWESTERN INDIANA 1950, 1960 AND 1970

Area		1950		1960		1970	
Lake		Male	Female	Male	Female	Male	Female
	no.	188,613	179,539	258,302	245,967	268,016	278,237
	%	51.2	48.7	50.3	49.6	49.0	50.9
Porter							
	no.	20,441	19,635	30,509	29,770	43,434	43,680
	%	51.0	48.9	50.6	49.3	49.8	50.1
Total							
	no.	209,054	199,174	288,811	284,737	311,450	321,917
	%	51.2	48.7	50.3	49.6	49.1	50.8

Sources: U.S. Department of Commerce, Bureau of the Census, Census of Population and Housing, 1950, 1960, 1970.

The racial composition of the region was 81.9 percent white and 18.1 percent non-white in 1970. A little over 97.5 percent of the non-white population reside in Gary, Hammond and East Chicago. Gary's non-white population constitutes 81.5 percent of the total non-white population.

The non-white population in the county area has grown 30.8 percent from 87,724 in 1960 to 114,739 in 1970. As a percent of the total population, non-whites have increased from 15.3 percent in 1960 to a 1970 level of 18.0.

The growth rates of the white and non-white populations show a strong trend toward an increasing number of non-whites. The white population grew 6.8 percent from 1960 to 1970, the non-white population, however, grew 30.8 percent during the same period. In actual numbers, the white population increased 32,804 and the non-white population 27,015.

Of the non-white 1970 Census population figure of 114,739 for the two-county area, the black population was 112,174. The remaining 2,565 population described as non-white were Indian (504), Japanese (235), Chinese (174), Filipino (309) or classified as "other" (1,343). Table 1d presents the racial (white/non-white) composition of the region. The Spanish-Speaking population of the Region for 1970 was 36,671.

TABLE 1d : RACIAL COMPOSITION OF NORTHWESTERN INDIANA

	1960		1970		Percent Change
	Number	Percent	Number	Percent	
Total	573,548	100.0	633,367	100.0	10.4 +
White	485,824	84.7	518,628	81.9	6.8 +
Non-white	87,724	15.3	114,739	18.1	30.8 +

Source : U.S. Department of Commerce, Bureau of the Census, Census of Population and Housing, 1960, 1970.

In the 1960 to 1970 decade, the median number of school years completed by the region's population 25 years of age and older rose from 10.5 to 12.0. Current (1970) figures for the State of Indiana and the CZM area townships are

presented on Table 1e, Ross Township in Lake County and Center Township in Porter County have the highest median number of school years completed, 12.2 and 12.4 respectively.

TABLE 1e : MEDIAN SCHOOL YEARS COMPLETED BY
BY STATE, COUNTY AND TOWNSHIP

LAKE	11.8	PORTER	12.3
CALUMET	11.5	CENTER	12.4
CENTER	12.2	JACKSON	12.1
HOBART	11.3	LIBERTY	12.1
NORTH	11.9	PINE	12.1
ROSS	12.2	PORTAGE	12.2
ST. JOHN	12.1	UNION	12.1
STATE OF INDIANA	12.1	WESTCHESTER	12.3

Source: U.S. Department of Commerce, Bureau of the Census, Census of Population and Housing, 1970.

The percent of population 25 years of age and older who have completed 4 or more years of high school compare as follows: northwestern Indiana - 50.0, the United States - 52.3, and the State of Indiana - 52.9.

The median educational level of minority groups is lower than that of the population as a whole. The black population of northwestern Indiana, 25 years of age and older, has a median number of school years completed of 10.7; the Latin population has a median number of school years completed of 8.9.

TABLE 1f : MEDIAN SCHOOL YEARS COMPLETED
BY SEX AND MINORITY GROUP

Population Group	Median School Years Completed		
	Male	Female	Total
Total Population 25 years and over	12.0	12.0	12.0
Total Black Population 25 years and over	10.3	11.0	10.7
Total Spanish-Speaking Population 25 years and over	8.8	8.9	8.9

Source: U.S. Department of Commerce, Bureau of the Census, Census of Population and Housing, 1970.

Personal and Family Finances

Family and per capita income in northwestern Indiana compare favorably to statistics for the state and the U.S.

As the statistics in Table 1g show, the great majority, 75.4 percent, of the region's families are in the \$7,000 to \$24,999 bracket. Specifically, 20.8 percent are in the \$7,000 - \$9,999 bracket, 34.4 percent are in the \$10,000 to \$14,999 bracket, and 20.2 percent are in the \$15,000 to \$24,999 bracket. The remainder, or 3.7 percent are in the upper bracket of \$25,000 or more.

The median family income in northwestern Indiana, \$11,012, is higher than the median for the United States and the State of Indiana.

Per capita income in northwestern Indiana, \$3,172, is also higher than the per capita for the United States and the State of Indiana. Table 1g presents comparable income statistics for the United States, the State, and the SMSA. Coastal Zone Townships' statistics are contained in Appendix A.

Spendable average weekly earnings during the third quarter of 1974 in northwestern Indiana were among the highest in the state. Lake County ranked second and Porter County ranked third among all Indiana counties with spendable average weekly earnings of \$187.66 and \$182.50 respectively. According to the "Indiana Business Review" (Indiana University Graduate School of Business, May 1975), these figures represent increases over the last quarter of 4.5 percent in Lake County and 5.6 percent in Porter County.

Bank deposits and savings and loan association savings capital in northwestern Indiana in 1970 totaled \$1,334,600,000 or \$2,107.15 per capita. This compares with per capita figures for the State of Indiana of \$2,586.62, and for the Fort Wayne, Indiana SMSA of \$2,920.24. The lower per capita figure in northwestern Indiana can be at least partially attributed to the amount

of banking from northwestern Indiana transacted with Chicago savings institutions.

TABLE 1g: FAMILY INCOME COMPARISONS 1969

Family Income	U.S. %	Indiana %	Northwestern Indiana %
Less than 3,000	10.3	7.8	6.8
3,000 - 4,999	10.0	8.4	6.1
5,000 - 6,999	11.9	11.4	8.0
7,000 - 9,999	20.6	22.6	20.8
10,000 - 14,999	26.6	30.4	24.4
15,000 - 24,999	16.0	15.9	20.6
25,000 or more	4.6	3.5	3.7
Median Family Income	\$9,586	\$9,966	\$11,012
Per Capita Income	\$3,119	\$3,070	\$ 3,172

Source: U.S. Department of Commerce, Bureau of the Census, County and City Data Book, 1972.

EMPLOYMENT

The inventory of employment data for the northwestern Indiana region includes historical data for large geographic levels, employment by place of residence for Lake and Porter Counties from Census statistics, employment by place of work for Lake and Porter Counties and townships from Indiana Employment Security Division (IESD) and supplemental sources, and unemployment statistics for the region for 1970-1975 from the IESD.

Geographic Level Comparisons

In analyzing the employment patterns of northwestern Indiana, it is well to initially examine the region's employment in relation to larger geographic levels. Table 2a presents labor statistics for 1960 and 1970 for the United States, the State of Indiana, and the SMSA. Northwestern Indiana's growth from 1960 to 1970 in civilian labor force, +11.7 percent, total employed, +13.2 percent, and total non-agricultural employment, +14.1 percent was in each case less than the percentage increase of the geographic levels studied. Total manufacturing employment, which accounts for about half the region's employment, remained relatively stable over the 10 year period, which would account for the smaller overall percentage increase.

Agricultural employment in northwestern Indiana decreased by more than half, -53.8 percent over the 10 year period. A large percentage decrease, 36.6 percent was likewise experienced in the United States. The percentage decrease for the region however was higher than the other geographic levels, perhaps reflecting the increased use of farm land for other purposes, and the availability of jobs for farm laborers in the region's industries.

Table 2b gives employment for non-agricultural wage and salaried workers by industrial category for the three geographic levels. Percentage changes

TABLE 2a : BASIC LABOR STATISTICS COMPARISONS 1960-1970

EMPLOYMENT STATUS	1960	1970	% CHANGE 1960-1970
Total Civilian Labor			
U.S.	69,628,000	82,715,000	+ 18.8
Indiana	1,828,300	2,177,900	+ 19.1
N.W. Indiana SMSA	221,400	247,400	+ 11.7
Total Employment			
U.S.	65,778,000	78,627,000	+ 19.5
Indiana	1,730,000	2,063,300	+ 19.5
N.W. Indiana SMSA	209,100	236,800	+ 13.2
Non-Agricultural ^a			
U.S.	60,318,000	75,165,000	+ 24.6
Indiana	---	---	--
N.W. Indiana SMSA	206,500	235,600	+ 14.1
Agricultural			
U.S.	5,458,000	3,462,000	+ 36.6
Indiana	---	---	--
N.W. Indiana SMSA	2,600	1,200	+ 53.8
Involved in Labor-Management Disputes			
U.S.	---	---	--
Indiana	---	10,300	--
N.W. Indiana SMSA	---	800	--

^aTotal non-agricultural includes wage and salaries, self-employed and domestics.

Source: U.S. Department of Labor, Bureau of Labor Statistics, Employment and Earnings: United States 1909-1971, Bulletin 1312-8.
 Indiana Employment Security Division, Manpower Trends in Indiana 1971.
 Indiana Employment Security Division, Gary, Hammond, East Chicago SMSA, Work Force Summaries 1960-1972.

in these categories from 1960-1970 are also shown. Manufacturing increases of 15.2 percent in the United States, and 19.6 percent in Indiana are much higher than the 1.8 percent increase experienced in northwestern Indiana.

Primary metals, the region's largest employer, increased by 9,400 or 15.0 percent. However, decreases in petroleum refining, 40.2 percent and fabricated metals 19.4 percent, offset having a larger overall increase in manufacturing employment over the 10 year period. Petroleum refining employment decreased in the United States 9.9 percent, and the State, 34.9 percent. In contrast,

TABLE 2b : 1960-1970 NON-AGRICULTURAL WAGE AND SALARIED EMPLOYMENT BY CATEGORY

CATEGORY	U.S.			INDIANA			CHICAGO-N.W. INDIANA SCA			N.W. INDIANA SMSA		
	1960	1970	% CHANGE	1960	1970	% CHANGE	1960	1970	% CHANGE	1960	1970	% CHANGE
MANUFACTURING	16,796,000	19,349,000	+15.2	593,900	710,200	+19.6	937,700	1,040,200	+10.9	105,900	107,800	+1.8
Durable	9,459,000	11,195,000	+18.3	439,900	542,600	+23.3	631,900	680,600	+7.7	84,700	91,300	+7.8
Lumber	626,800	572,700	-8.6	10,700	11,700	+9.3	7,900	7,900				
Furniture	383,000	459,800	+20.0	21,200	23,200	+9.4	23,600	23,600				
Stone, Clay, Glass	604,000	640,200	+6.0	26,100	24,000	-8.0	21,700	21,700				
Primary Metals	1,231,200	1,315,600	+6.8	95,400	111,900	+17.3	128,000	140,100	+9.4	62,700	72,100	+15.0
Fabr. Metals	1,135,300	1,380,400	+21.6	41,800	54,900	+31.3	108,300	115,100	+6.3	9,800	7,900	-19.4
Non. Elect. Mach.	1,479,000	1,982,100	+34.0	53,300	71,000	+33.2	125,600	125,600				
Elect. Mach.	1,467,100	1,917,000	+30.7	87,400	118,500	+35.6	151,900	151,900				
Trans. Equip.	1,568,900	1,799,100	+14.7	88,200	96,600	+9.5	31,200	31,200				
Instruments	354,300	460,400	+29.9	4,600	6,600	+43.7	34,400	34,400				
Ordinance - Misc.	220,000	241,900	+9.9	11,200	24,200	+116.0	28,600	28,600				
Non-Durable	7,336,000	8,154,000	+11.1	154,000	167,600	+8.8	336,900	359,600	+6.7	21,200	16,500	-22.2
Food	1,790,000	1,782,800	-.4	49,500	44,100	-10.9	90,900	90,900				
Apparel - Textiles	1,233,200	1,364,600	+10.6	14,700	13,500	-8.2	23,500	23,500				
Paper	601,100	705,500	+17.4	12,900	15,200	+17.8	33,100	33,100				
Printing	911,300	1,101,600	+20.9	21,300	27,800	+30.5	98,900	98,900				
Chemicals	828,200	1,049,000	+26.7	23,000	28,600	+24.3	56,800	56,800				
Petroleum Ref.	211,900	190,800	-9.9	10,600	6,900	-34.9	14,200	14,200	-21.5	9,700	5,800	-40.2
Rubber - Plastic	379,000	580,100	+53.0	18,900	28,400	+50.3	31,500	31,500				
Tobacco - Leather	457,400	405,100	-11.4	3,300	3,100	-6.1	7,500	7,500				
NON-MANUFACTURING	34,437,000	51,246,000	+48.8	837,500	1,138,800	+36.4	1,694,400	2,154,800	+27.2	86,100	115,500	+34.1
MINING	712,000	623,000	-12.5	9,700	7,000	-27.8	4,700	4,700				
CONSTRUCTION	2,885,000	3,381,000	+17.2	63,900	79,300	+24.9	123,600	131,200	+6.1	12,100	12,600	+3.9
TRANS., COMM., UT.	4,004,000	4,493,000	+12.2	94,600	102,200	+8.0	215,900	217,100	+6	13,300	13,900	+4.5
TRADE	11,391,000	14,914,000	+30.9	283,500	367,300	+29.5	562,200	704,600	+25.3	28,600	36,700	+28.3
FIN., INS., R. EST.	2,669,000	3,688,000	+38.1	56,900	76,200	+33.9	154,300	188,700	+22.3	4,800	6,200	+29.1
SERVICES	7,423,000	11,612,000	+56.4	140,500	219,700	+56.4	379,400	524,200	+38.2	13,800	23,000	+66.7
GOVERNMENT	8,353,000	12,535,000	+50.1	188,500	286,400	+51.9	252,800	384,400	+52.0	13,500	23,100	+71.1

Sources: U.S. Department of Labor, Bureau of Labor Statistics, Employment and Earnings: United States 1909-1971, Bulletin 1312-8.
U.S. Department of Labor, Bureau of Labor Statistics, Employment and Earnings: States and Areas 1939-1971, Bulletin 1370-9, pp. 189-200
Indiana Employment Securities Division and U.S. Department of Labor, Indiana Work Force Summaries 1960-1972.
Indiana Employment Securities Division, Gary, Hammond, East Chicago, SMSA, Work Force Summaries 1960-1972.

fabricated metals decreased only in the region, and increased in the United States 21.6 percent, and the State 31.3 percent.

At all geographic levels, non-manufacturing showed large increases; 16,809,000 employees or 48.8 percent in the United States, 301,300 employees or 26.4 percent in the State, and 29,400 employees or 34.1 percent in the region. Trade, the non-manufacturing category with the greatest number of employees, increased fairly equally at all geographic levels. Service and government, the next largest categories, showed the greatest increases over the ten year period at all the geographic levels. In northwestern Indiana, Service increased by 9,200 employees or 66.7 percent, and Government by 9,600 employees or 71.1 percent. These percentage increases for the region were higher than those of all other geographic levels.

Other non-manufacturing categories such as construction, transportation, communication and utilities showed less growth in the region than nationally or in the State.

Employment By Place Of Residence

The 1960 and 1970 Censuses of Population provide data on the occupational groups and industrial categories of employed persons by their place of residence for the total two-county region and separately for Lake and Porter Counties. This data will be used to show changes in the occupational groups and industrial categories of employees living in northwestern Indiana.

Employment by Occupational Group

Occupational data for the region is presented on Table 2c. In 1960 and 1970, the greatest number of employees were craftsmen-foremen and operatives. These two groups accounted for over 40 percent of the occupations in the region for both census years and showed increases of 15.4 percent in the craftsmen-foremen group and 7.5 percent in the operatives group.

TABLE 2c EMPLOYMENT BY OCCUPATIONAL GROUP

LAKE COUNTY							
Group	1960	1970	Employment Change 1960-1970	1960 % of Total in County	1970 % of Total in County	1960 % of SMSA	1970 % of SMSA
Professional-Technical	15,803	22,215	+40.6	8.6	11.0	86.2	83.3
Managers & Administrators	9,786	10,139	+3.6	5.3	5.0	85.3	82.0
Clerical Workers	24,431	33,297	+36.3	13.3	16.5	89.9	85.8
Sales Workers	9,565	10,518	+9.9	5.2	5.2	88.2	85.0
Craftsmen & Foremen	40,892	44,813	+9.6	22.3	22.3	90.1	85.5
Laborers (Except Farm)	17,740	14,906	-16.0	9.6	7.4	94.0	90.5
Operatives	38,955	40,508	+4.0	21.2	20.1	91.2	88.2
Private Household	2,310	1,639	-29.0	1.3	.8	86.6	88.3
Service	13,728	22,446	+63.5	7.5	11.2	88.9	85.8
Farm Laborers	390	324	-16.9	.2	.2	55.2	64.8
Farmers/Farm Managers	817	540	-33.9	.4	.3	53.7	58.8
Not Reported	9,355	N.A. ^a	N.A.	5.1	N.A.	94.4	N.A.
TOTAL	183,772	201,345	+9.6	100.0	100.0	89.6	85.9
PORTER COUNTY							
Professional-Technical	2,532	4,460	+76.1	11.9	13.5	13.8	16.7
Managers & Administrators	1,682	2,222	+32.1	7.9	6.7	14.7	18.0
Clerical Workers	2,737	5,511	+101.4	12.9	16.7	10.1	14.2
Sales Workers	1,284	1,848	+43.9	6.0	5.6	11.8	15.0
Craftsmen & Foremen	4,505	7,584	+68.3	21.2	22.9	9.9	14.5
Laborers (Except Farm)	1,132	1,568	+38.5	5.3	4.7	6.0	9.5
Operatives	3,757	5,416	+44.1	17.7	16.4	8.8	11.8
Private Household	352	217	-38.3	1.7	.7	13.2	11.7
Service	1,711	3,711	+116.9	8.0	11.2	11.0	14.2
Farm Laborers	316	176	-44.3	1.5	.5	44.8	35.2
Farmers/Farm Managers	704	379	-46.1	3.3	1.1	46.3	41.2
Not Reported	553	N.A.	N.A.	2.6	N.A.	5.6	N.A.
TOTAL	21,265	33,092	+55.6	100.0	100.0	10.4	14.1
NORTHWESTERN INDIANA							
Professional-Technical	18,335	26,675	+45.5	--	--	8.9	11.4
Managers & Administrators	11,468	12,361	+7.8	--	--	5.6	5.3
Clerical Workers	27,168	38,808	+42.8	--	--	13.3	16.6
Sales Workers	10,849	12,366	+14.0	--	--	5.3	5.3
Craftsmen & Foremen	45,397	52,397	+15.4	--	--	22.2	22.4
Laborers (Except Farm)	18,872	16,474	-12.7	--	--	9.2	7.0
Operatives	42,712	45,924	+7.5	--	--	20.8	19.6
Private Household	2,662	1,856	-30.3	--	--	1.3	.8
Service	15,439	26,157	+69.4	--	--	7.5	11.1
Farm Laborers	706	500	-29.2	--	--	.4	.2
Farmers/Farm Managers	1,521	919	-39.6	--	--	.7	.4
Not Reported	9,908	N.A.	N.A.	--	--	4.8	N.A.
TOTAL	205,037	234,437	+14.3			100.0	100.0

^a N.A. - Not ApplicableSources: U.S. Department of Commerce, Bureau of the Census, Census of the United States, 1960-1970: Population.

The concentration of employment in these two occupational categories is to be expected because of the major primary metals industry where such occupations predominate. However, in making comparisons between individual occupational groups and specific industrial categories, it must be noted that the same occupational group can be found in several industries.

The occupations showing the greatest percentage increases between 1960 and 1970 were service, 10,718 or 69.4 percent, professional-technical, 8,340 or 45.5 percent, and clerical, 11,640 or 42.8 percent. The growth in the government and service industry categories during the ten-year period would account for much of the increase in these occupational groups. By 1970, professional-technical, clerical, and service occupations together accounted for 91,640 employees or 39.1 percent of the total occupations in the region, an increase of 9.4 percent over 1960 when they were 60,942 or 29.7 percent of the total.

Farm laborers and farmers/farm managers were the occupations which experienced large declines from 1960-1970. While the decreases of 206 employees, 29.2 percent, for farm laborers and 602 employees, 39.6 percent, for farmers/farm managers are high, it must be pointed out that these occupations together were only 1.1 percent in 1960 and .6 percent in 1970 of the total occupations in the region. The decrease in those identifying their occupations as farm laborers and farmers/farm managers is also reflected in the 25.9 percent decrease between the census years 1960-1970 in agricultural industry employment.

Other occupational changes between 1960-1970 include a 7.8 percent increase in managers and a 14.0 percent increase in sales workers. Both groups remained relatively stable from 1960-1970 in the percentage each comprised of the total occupations in the SMSA: managers going from 5.6 percent to 5.3 percent and sales workers remaining at 5.3 percent.

Total employment in all occupations categories increased 14.3 percent between 1960 and 1970. This increase represented an additional 29,400 employees living in the region.

Table 2c also gives a breakdown of residential occupation data by each county in the region. Each county's greatest occupational growth from 1960 to 1970 occurred in the service group with Lake County increasing by 8,718 or 63.5 percent, and Porter County by 2,000 or 116.9 percent. The occupational category which had the most employees living in each county for both census years was the craftsmen-foremen group. However Porter County showed a much higher percentage increase, 68.3 percent, in the ten year period than Lake County, 9.6 percent. Professional-technical occupations increased in both counties, but Porter County again showed a greater percentage increase, 76.1 percent or 1,298, than Lake County, 40.6 percent or 6,412. Also, in 1970, professional-technical occupations comprised a slightly higher percentage of the occupations of persons residing in Porter County, 12.5 percent, than Lake County, 11.5 percent. In both counties, clerical workers showed significant increases from 1960-1970 with Lake County increasing by 8,866 or 36.3 percent, and Porter County more than doubling the number of clerical workers living in the county to 5,511 for a 101.4 percent increase.

The operatives group showed a much greater increase in Porter County in both percentage, 44.1 percent and total number of workers, 1,659, than Lake County with an increase of 1,553 workers or 4.0 percent. The craftsmen-foremen and operatives group increases in Porter County can be largely attributed to the primary metals industrial growth in Porter County during the decade.

Groups which declined in both Lake and Porter Counties were private household workers, farmers/farm managers and farm laborers. The decline in the private household worker occupation was similar in both counties, with Porter County decreasing by 38.3 percent and Lake County by 29.0 percent. The decrease in the percentage private household workers comprised of the total occupations in each county was equally similar: 1.3 percent in 1960 to .8 percent in 1970 for Lake County, and 1.7 percent in 1960 to .7 percent in 1970 for Porter County.

The farm laborers and farmers/farm managers groups showed a much greater decrease in Porter County than in Lake County. In 1960, these two groups made up .6 percent of the total occupations in Lake County and 4.8 percent in Porter County. By 1970, Lake County showed .5 percent of its total occupations in these two groups; however, Porter County had dropped to 1.6 percent of the total. In Porter County, farm laborers decreased by 140 or 44.3 percent, and farmers/farm managers by 325 or 46.1 percent, whereas Lake County lost 66 farm laborers for a 16.9 percent decline, and 277 farmers/farm managers or 33.9 percent.

The growth in numbers of workers living in Porter County was 11,827 or 55.6 percent in the ten year period. In Lake County 17,573 resident workers were added, an increase of only 9.6 percent. The percentage of workers by occupation group living in each county also reflects growth in Porter County. In 1960, 89.6 percent of the total employed persons lived in Lake County and 10.4 percent in Porter County. By 1970, Porter County increased to 14.1 percent and Lake County decreased to 85.9 percent of the total workers. In Lake County, the percent of resident employees decreased in all occupational groups except private household,

farm laborers and farmers/farm managers. Craftsmen-foremen showed the greatest change of all the groups, dropping from 90.1 percent to 85.5 percent in Lake County and increasing 9.9 percent to 14.5 percent in Porter County.

Employment by Industrial Category

Employment of workers living in the SMSA by industrial category for 1960 and 1970 is presented on Table 2d. Categories experiencing the greatest growth over the ten year period were other durable manufacturing, 4,482 or 61.2 percent; government, 6,044 or 53.3 percent; construction, 2,477 or 22.5 percent; trade, 9,502 or 30.5 percent; and service, 7,281 or 26.6 percent. Mining had an increase of 245.5 percent but this category accounted for only .1 percent of the total employees living in the region. Increases in printing, 3.9 percent, finance, insurance and real estate, 3.6 percent, and primary metals, 5.0 percent, were considerably smaller. Primary metals, employing one-third of the residents of the SMSA for both Census years, increased only 3,356 employees.

From 1960 to 1970, fewer residents of the SMSA were employed in the industrial categories of food manufacturing, which lost 945 employees or 28.3 percent; other non-durables, which lost 2,564 or 24.2 percent; chemicals, which lost 911 or 23.8 percent; and agriculture, which lost 618 for a 25.9 percent decline.

The figures on Table 2d also show that employees living in Lake County increased in all but six industrial categories from 1960 to 1970. In Porter County increases occurred in all categories but three. Significant increases occurred in Lake County in the categories of other-durables, which increased by 3,493 or 58.0 percent; trade by 7,560 or 27.8 percent; and service by 4,332 or 18.0 percent. The percentage increase in employees living in Porter County was much higher in nearly all categories.

TABLE 2d : EMPLOYMENT BY INDUSTRIAL CATEGORY

NORTHWESTERN INDIANA							
Category ^a	1960	1970	% Change 1960-70	1960 % of Co.	1970 % of Co.	1960 % of SMSA	1970 % of SMSA
Service	27,423	34,704	+26.6	--	--	13.4	14.8
Construction	11,021	13,498	+22.5	--	--	5.4	5.8
Food Manufacturing	3,334	2,389	-28.3	--	--	1.6	1.0
Other Non-Durable	10,597	8,033	-24.2	--	--	5.2	3.4
Other Durable	7,325	11,807	+61.2	--	--	3.6	5.0
Printing	2,631	2,735	+3.9	--	--	1.3	1.2
Chemicals	3,818	2,907	-23.8	--	--	1.9	1.2
Metals	67,036	70,392	+5.0	--	--	32.7	30.0
Transportation Equipment	4,673	5,402	+15.6	--	--	2.2	2.3
Transportation, Communication, Utilities	13,701	13,638	-0.4	--	--	6.7	5.8
Trade	31,134	40,636	+30.5	--	--	15.2	17.4
Finance, Insurance, Real Estate	8,538	8,843	+3.6	--	--	4.1	3.8
Government ^b	11,331	17,375	+53.3	--	--	5.5	7.4
Mining	90	311	+245.5	--	--	--	0.1
Agriculture	2,385	1,767	-25.9	--	--	1.2	0.8
TOTAL	205,037	234,437	+14.3			100.0	100.0
LAKE COUNTY							
Service	24,076	28,408	+18.0	13.1	14.1	11.7	12.1
Construction	9,378	10,858	+15.8	5.1	5.4	4.6	4.6
Food Manufacturing	3,134	2,252	-28.0	1.7	1.1	1.5	1.0
Other Non-Durable	9,946	7,528	-24.3	5.4	3.7	4.9	3.2
Other Durable	6,024	5,517	+58.0	3.3	4.7	2.9	4.0
Printing	2,352	2,397	+1.9	1.3	1.2	1.1	1.0
Chemicals	3,707	2,738	-26.1	2.0	1.4	1.8	1.2
Metals	62,395	62,160	-0.3	34.0	30.9	30.4	26.5
Transportation Equipment	4,432	4,823	+8.1	2.4	2.4	2.2	2.0
Transportation, Communication, Utilities	12,192	11,827	-3.0	6.6	5.9	5.9	5.0
Trade	27,221	34,781	+27.8	14.8	17.3	13.3	14.8
Finance, Insurance, Real Estate	7,448	7,653	+2.7	4.1	3.8	3.6	3.3
Government	10,065	15,010	+49.1	5.5	7.5	4.9	6.4
Mining	72	274	+280.5	--	0.1	--	0.1
Agriculture	1,330	1,119	-15.9	0.7	0.5	0.6	0.5
TOTAL	183,772	201,345	+9.6	100.0	100.0	89.4	85.7
PORTER COUNTY							
Service	3,347	6,296	+88.1	15.8	19.0	1.6	2.7
Construction	1,643	2,640	+60.7	7.7	8.0	0.8	1.1
Food Manufacturing	200	137	-31.5	0.9	0.4	0.1	--
Other Non-Durable	651	505	-22.4	3.1	1.5	0.3	0.2
Other Durable	1,301	2,290	+76.0	6.1	6.9	0.6	1.0
Printing	279	338	+15.6	1.3	1.0	0.1	0.1
Chemicals	111	169	+52.2	0.5	0.5	--	--
Metals	4,641	8,232	+77.4	21.8	24.9	2.3	3.5
Transportation Equipment	241	579	+140.2	1.1	1.8	0.1	0.2
Transportation, Communication, Utilities	1,509	1,811	+20.0	7.1	5.5	0.7	0.8
Trade	3,913	5,855	+49.6	18.4	17.7	1.9	2.5
Finance, Insurance, Real Estate	1,090	1,190	+9.1	5.1	3.6	0.5	0.5
Government	1,266	2,365	+86.8	6.0	7.1	0.6	1.0
Mining	18	37	+105.5	0.1	0.1	--	--
Agriculture	1,055	648	-38.6	5.0	2.0	0.5	0.3
TOTAL	21,265	33,092	+55.6	100.0	100.0	10.1	13.9

^aCategories given are combinations of those used in the Census; however, totals remain constant.

^bIncludes only Public Administration and Schools.

Sources: U.S. Department of Commerce, Bureau of the Census, Census of the United States, 1960-1970: Population.

Primary metals, the industrial category of the majority of workers residing in both counties, dropped 0.3 percent in Lake County, but increased by 3,591 or 77.4 percent in Porter County. By 1970, 24.9 percent of the residents in Porter County and 30.9 percent of those in Lake County identified their industrial category as primary metals. Porter County showed larger increases in residents working in the categories of service, 2,949 or 88.1 percent; government, 1,099 or 86.8 percent; other-durables, 989 or 76.0 percent; construction, 997 or 60.7 percent; and trade, 1,942 for an increase of 49.6 percent.

Fewer persons in both counties in 1970 were employed in food manufacturing, other non-durables and agriculture. Lake County decreased 28.0 percent or 882 residents employed in food manufacturing, and Porter County decreased 31.5 percent or 63 employed persons. Other non-durables which comprised 5.4 percent of the employed persons living in Lake County in 1960 decreased 2,418 or 24.3 percent by 1970, totaling only 3.7 percent of the county's employed persons. In Porter County persons employed in other non-durables decreased by 146 or 22.4 percent by 1970 and dropped from 3.1 percent in 1960 to 1.5 percent in 1970 of the total employed persons living in Porter County. Agriculture showed a greater decrease in Porter County, 38.6 percent or 407 employees, during the decade, than in Lake County, which dropped 15.9 percent or 211 employees. Residents of Porter County employed in chemicals increased by 58 or 52.2 percent, but those in Lake County decreased by 969 or 26.1 percent.

In general, the number of employed persons living in Lake County remained fairly stable in most industrial categories over the ten year period. Porter County, however, showed large increases in several categories, which is reflected in the 55.6 percent (11,827) increase in total employees living in the county.

Employment by Place of Work

The Census employment figures which have been presented all relate to employees living in the SMSA who may or may not work in the SMSA. Therefore, data has also been tabulated and analyzed by quarter section zone for persons who work in the SMSA, though they may not reside in either of the two counties.

In order to obtain figures of employment by place of work for each quarter section zone, it was necessary to perform several operations. Initially, data on employment was collected from the Indiana State Highway Commission (ISHC) for employers covered by the Indiana Employment Securities Division. Added to this data were supplemental employment figures on non-covered employment and a distribution of employment to zones through land use or existing employment ratios. The procedures followed in the development of this data are detailed in a report entitled "Employment Survey Technical Report."

(Northwestern Indiana Regional Planning Commission, 1974.) Table 2e presents 1971 employment by place of work for the SMSA and Lake and Porter Counties. Table 2f presents township employment by place of work generated by aggregating quarter section zones.

In the total SMSA and each of its counties, the largest employer is the steel mills. The steel industry provided 69,025 or 29.5 percent of the jobs in 1971. In Lake County, 29.4 percent, or 61,076 persons worked in the steel industry, which accounted for 88.5 percent of the steel mill employment in the SMSA. Porter County, with 11.5 percent of the steel mill employment in the SMSA, had 7,949 workers or 30.8 percent of the jobs in the county. Other primary metals, fabricated metals, transportation equipment and other-durables, which together with the steel mills comprise all durable manufacturing, totaled 22,686 employees or 8.7 percent of the jobs in the SMSA. The vast majority of durable manufacturing employment was in Lake County; however, in the other-durables category, 25.1 percent or 1,860 employees had jobs in Porter County.

TABLE 2e : NON-FARM INDUSTRY, EMPLOYMENT BY PLACE OF WORK, 1971

Category ^a	Total SMSA	% In SMSA	Lake County	% In Lake County	% Of SMSA By Category	Porter County	% In Porter County	% Of SMSA By Category
Service	23,100	9.9	18,799	9.0	81.4	4,301	16.7	18.6
Construction	10,395	4.4	9,061	4.4	87.2	1,334	5.2	12.8
Food Manufacturing	2,902	1.2	2,802	1.3	96.6	100	.4	3.4
Printing	2,243	1.0	1,994	1.0	88.9	249	1.0	11.1
Chemicals	2,976	1.3	2,946	1.4	99.0	30	.1	1.0
Petroleum Refining	5,831	2.5	5,826	2.8	99.9	5	--	.1
Other Non-Durables	2,253	1.0	2,043	1.0	90.7	210	.8	9.3
Steel Mills	69,025	29.5	61,076	29.4	88.5	7,949	30.8	11.5
Other Primary Metals	5,097	2.2	5,026	2.4	98.5	77	.3	1.5
Fabricated Metals	7,036	3.0	6,677	3.2	94.9	359	1.4	5.1
Transportation Equipment	3,131	1.3	3,131	1.5	100.0	0	--	--
Other Durables	7,422	3.2	5,562	2.7	74.9	1,860	7.2	25.1
Transportation, Communication, Utilities	14,274	6.1	13,189	6.4	92.4	1,085	4.2	7.6
Trade	36,543	15.6	32,636	15.7	89.3	3,907	15.1	1.7
Finance, Insurance, Real Estate	6,300	2.7	5,672	2.7	90.0	628	2.4	10.0
Government	22,822	9.8	20,445	9.8	89.6	2,377	9.2	10.4
All Other Non-Agriculture	12,305	5.3	10,957	5.3	89.1	1,348	5.2	10.9
TOTAL	233,555	100.0	207,836	100.0	88.9	25,819	100.0	11.1

^aNon-Farm Industry employment includes wage and salaried workers, domestics and self-employed.

Source: Northwestern Indiana Regional Planning Commission, 1971 Employment Inventory.

TABLE 2f : NON-FARM INDUSTRY -
TOWNSHIP EMPLOYMENT BY PLACE OF WORK - 1971

	LAKE COUNTY							
	MANUFACT.	CONST. & MINING	T.C. & U.	TRADE	F.I.R.E.	S.S.	GOV.	OTHER
TOTAL	97,077	9,080	13,189	32,636	5,672	18,799	19,745	10,944
CALUMET	37,875	3,284	5,341	12,299	2,232	7,042	9,644	4,334
CENTER	235	125	335	837	260	733	694	175
HOBART	127	169	317	1,404	81	430	1,123	198
NORTH	57,911	4,754	7,074	14,738	2,608	8,287	6,858	5,731
ROSS	262	326	5	1,487	289	896	532	208
ST. JOHN	210	352	74	1,202	162	970	395	185
	PORTER COUNTY							
	MANUFACT.	CONST. & MINING	T.C. & U.	TRADE	F.I.R.E.	S.S.	GOV.	OTHER
TOTAL	10,840	1,315	1,085	3,907	628	4,301	2,377	1,343
CENTER	1,899	527	416	2,470	361	3,602	753	554
JACKSON	0	24	0	4	0	11	14	2
LIBERTY	13	13	31	13	0	23	43	6
PINE	0	0	59	34	0	25	3	6
PORTAGE	2,326	219	349	468	70	260	708	132
UNION	14	12	0	0	0	3	41	3
WESTCHESTER	6,378	498	199	616	154	356	655	600

Source: Northwestern Indiana Regional Planning Commission, 1971 Employment Inventory.

In non-manufacturing, the category which accounted for 15.6 percent of the total employment in the SMSA was trade, both wholesale and retail. The SMSA had 36,543 workers in trade, with Lake County accounting for 32,636 or 89.3 percent, and Porter County for 3,907 or 10.7 percent. Trade comprised 15.7 percent of the jobs in Lake County and 10.7 percent of the jobs in Porter County. Service and government were the next largest non-manufacturing categories in the SMSA and in each county. Service employed 23,100 workers in the SMSA in 1971: 18,799 or 81.4 percent were in Lake County and 4,301 or 18.6 percent were in Porter County. The service category made up 9.9 percent of the SMSA's total employment; 9.0 percent of Lake County's employment and 16.7 percent of Porter County's employment. Government, with 22,822 or 9.8 percent of the total SMSA employment, accounted for 20,445 or 9.8 percent of the jobs in Lake County and 2,377 or 9.2 percent of the jobs in Porter County. Transportation, communication and utilities in the SMSA totaled 13,189 or 6.4 percent of the employees in Lake County and 1,085 or 4.2 percent of the employees in Porter County. The remaining categories, other non-agriculture (12,305), construction (10,395) and finance-insurance-real estate (6,300) totaled 29,000 workers in the SMSA or 12.4 percent of the total SMSA employment. The non-manufacturing categories together totaled 53.8 percent of the employment in Lake County and 58.0 percent of the employment in Porter County. Similar statistics for the coastal townships are presented in Table 2f.

The total number of jobs by all townships is presented in Table 2g to show the distribution of employment in Lake and Porter Counties. The heaviest concentration of jobs falls in the Lake County townships of North with 108,642 or 46.5 percent, and Calumet with 82,107 or 35.1 percent of the

region's 233,655 jobs. Center (10,581 jobs) and Westchester (11,456 jobs) townships in Porter County together account for another 9.1 percent. Employment is fairly equal in the townships of Center (3,395), Hobart (3,873), Ross (4,005), and St. John (3,578).

TABLE 2g: TOTAL TOWNSHIP EMPLOYMENT BY PLACE OF WORK, 1971

	TOWNSHIP	EMPLOYMENT	% OF REGION
LAKE:	Calumet*	82,107	35.1
	Cedar Creek	1,121	0.5
	Center*	3,395	1.5
	Eagle Creek	--	--
	Hanover	508	0.2
	Hobart*	3,873	1.7
	North*	108,642	46.5
	Ross*	4,005	1.7
	St. John*	3,578	1.5
	West Creek	455	0.2
	Winfield	148	0.1
PORTER:	Boone	249	0.1
	Center*	10,581	4.5
	Jackson*	55	--
	Liberty*	142	0.1
	Morgan	27	--
	Pine*	127	0.1
	Pleasant	211	0.1
	Portage*	2,551	1.1
	Porter	55	--
	Union*	73	--
	Washington	287	0.1
	Westchester*	11,456	4.9
	TOTAL	233,655	100.0

* denotes CZM study area township

Source: Northwestern Indiana Regional Planning Commission, 1971 Employment Inventory.

Unemployment

Three categories of unemployment must be considered in analyzing northwestern Indiana's economy. Each is the result of different conditions and impacts the economy in varying ways.

Of the three categories -- frictional, cyclical and structural -- frictional has the least severe impact. Such unemployment is a result of the normal process of adjustment within a specialized labor force as it reacts to the changing demands of the economy. Economists estimate that frictional unemployment accounts for between 3 percent and 4.5 percent of the nation's unemployment. There is no reason to believe that the frictional unemployment in northwestern Indiana is any higher. Furthermore, such unemployment is short term for each affected member of the labor force and therefore does not present as serious a problem to the unemployed worker or economy as would unemployment caused by cyclical or structural dislocations.

Cyclical unemployment, it must be noted, is a function of the national economy and is caused by temporary declines in national aggregate spending. Although cyclical unemployment tends to most affect manufacturers of durable goods, the basic steel industry is perhaps less directly affected than are manufacturers of consumer goods. Severe cyclical downturns, however, do adversely affect the region's steel industry.

Structural unemployment and chronic structural unemployment pose the greatest threats to northwestern Indiana's economic well-being. Structural unemployment is characterized by three factors: (a) it requires a basic occupational adaptation on the part of displaced workers, (b) it persists much longer than frictional unemployment, and (c) it can engender serious social problems. Chronic structural unemployment is even more severe in its effects and has the additional characteristics of being concentrated on a comparatively small portion of the labor force, and persisting even through economic upturns.

It is difficult to determine the number of workers who are affected by chronic unemployment and who have become discouraged and dropped out of the active work force, but there is good reason to believe that northwestern Indiana's economy contains a large and growing number of "hidden unemployed."

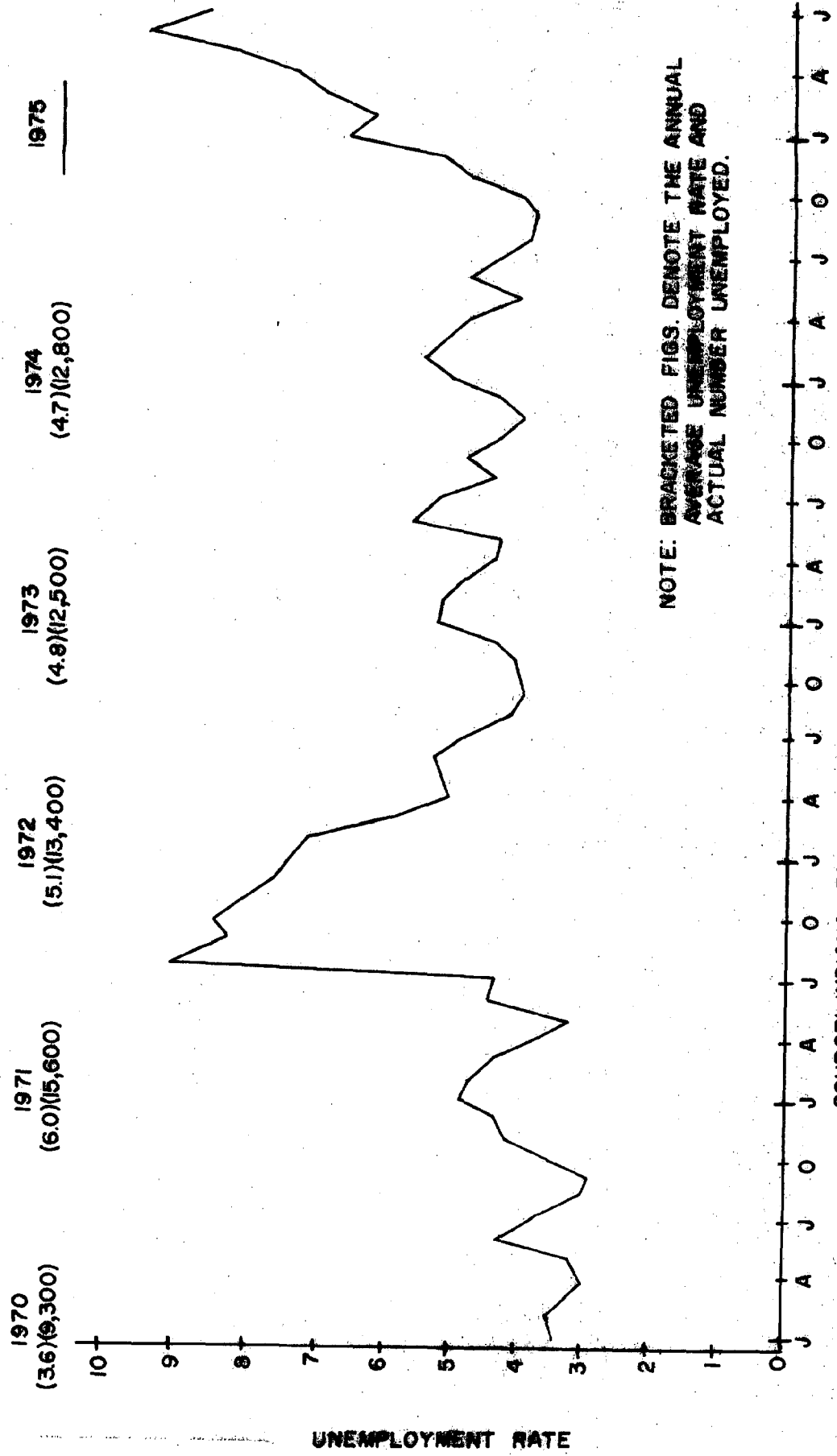
Future economic development planning will attempt to identify the magnitude of structural unemployment in some detail as its impact on both those persons directly affected and on the region's economic future are considered to be of vital importance.

Modernization and mechanization of the region's principal industry and the high skill levels required in the growing service industries of the region accentuate the potential problems of structural unemployment. Adequately training and retraining the labor force will play an increasingly important role in the development of northwestern Indiana's economy and in minimizing future unemployment problems. Diversifying employment opportunities will, of course, also play a major role in addressing the problem of structural unemployment and will impact unemployment caused by cyclical downturns in the economy.

The annual recorded unemployment rate in northwestern Indiana in recent years has ranged from 3.6 percent in 1970 to 6.0 percent in 1971. The rate declined in 1972 to 5.1 percent followed by a range of 4.8 percent in 1973 and 4.7 percent in 1974. Figure I shows the quarterly and annual average unemployment rates for the period 1970 to the present for the SMSA.

FIGURE I

MONTHLY AND ANNUAL UNEMPLOYMENT



NOTE: BRACKETED FIGS. DENOTE THE ANNUAL AVERAGE UNEMPLOYMENT RATE AND ACTUAL NUMBER UNEMPLOYED.

SOURCE: INDIANA EMPLOYMENT SECURITY DIVISION.

POPULATION AND EMPLOYMENT FORECASTS

Reliable estimates of future population and employment levels are crucial to any planning effort. These forecasts are necessary for the determination of required future capacities of major public services and in the formulation of proposals for the use of the region's land and water resources. They can also serve as indicators of potential problems associated with the region's coastal zone.

The number of people who will live and work in northwestern Indiana in future decades, as well as the general geographical patterns of the locations of their homes and places of employment, are the most important considerations in the development of the plans. They are the basic elements in the determination of the future needed size and the appropriate location of sewers, highways and water mains, the calculation of requirements for housing construction, and the estimation of future needs for recreational open space, educational facilities and other urban services. Using reliable population and employment forecasts, public services can be provided efficiently and with maximum accessibility and convenience of use.

Population and employment forecasts were generated by the Northwestern Indiana Regional Planning Commission as part of an eight-county northeastern Illinois - northwestern Indiana effort in cooperation with the Northeastern Illinois Planning Commission. The base year for the forecasts is 1970. They were developed after an analysis of past trends relating to population growth and expected future changes in those trends. Population forecasts were generated using a combination of the cohort-survival and population-to-employment ratio techniques. Employment forecasts were developed through the use of a "shift-share" methodology, comparing national growth rates to those in northwestern Indiana.

In addition to these forecasts prepared by the Northwestern Indiana Regional Planning Commission, the Division of Research, School of Business, Indiana University, at Bloomington has prepared population estimates at the county level for the State Board of Health. These population forecasts are also presented in this report.

Population Forecasts

During the period between the years 1970 and 2000, the population of northwestern Indiana is forecasted to grow by more than 198,000 persons -- from 633,367 to 831,800. This represents an increase of over 30%. The new growth will involve considerable investment in new residential development and in the basic urban services necessary to adequately support this development. The particular form this growth takes and the manner in which the services are provided will be of crucial importance for the quality of living environments, the protection of natural resources, and the cost, through taxes, of public services. Regional population forecasts for 1980 through 2000 are shown in Table 3a. Also included in Table 3a are 1960 and 1970 figures for population and percent change.

TABLE 3a : POPULATION FORECASTS FOR
NORTHWESTERN INDIANA

Year	Population	Percentage Change
1960	573,548	---
1970	633,367	+10.4%
1980	697,700	+10.2%
1990	773,000	+10.8%
2000	831,800	+ 7.6%

Sources: U.S. Department of Commerce, Bureau of the Census (1960 and 1970 estimates) Northwestern Indiana Regional Planning Commission (1980 through 2000 forecasts)

For the purposes of regional planning, population forecasts must be available for smaller areas within the region. The availability of forecasts by small area enables plans to be developed which are sensitive to growth trends within the two counties. Sewer, highways, parks and other public facilities should be planned to satisfy locational needs for these services.

For this reason, the two-county population forecasts have been distributed to 43 sub-regional zones. A map of these zones is shown on page 32. The delineation of the sub-regional zones involved the application of criteria such as the location and concentrations of population and employment, the boundaries of cities, towns and townships, and the availability of data.

In the delineation of the sub-regional zones, an attempt was made to make forecasts available by city and town, where possible. Therefore, several municipalities are zones or aggregations of two or more zones. In addition, with a few minor deviations, every civil township is a zone or an aggregation of zones.

Population forecasts were allocated to the 43 sub-regional zones through the use of a mathematical model. This model used growth trends and estimates of opportunities for new residential development or renewal to allocate regional population forecasts to the sub-regional zones. The sub-regional population forecasts for the year 1980, 1990 and 2000 for each of the zones, together with population counts for 1960 and 1970, are shown in Table 3b.

These forecasts are used by the Northwestern Indiana Regional Planning Commission in its "701" planning and transportation planning efforts. To date these projections have also been used in "208" Water Quality planning for the region. Hence, many of the estimates or projections of need included

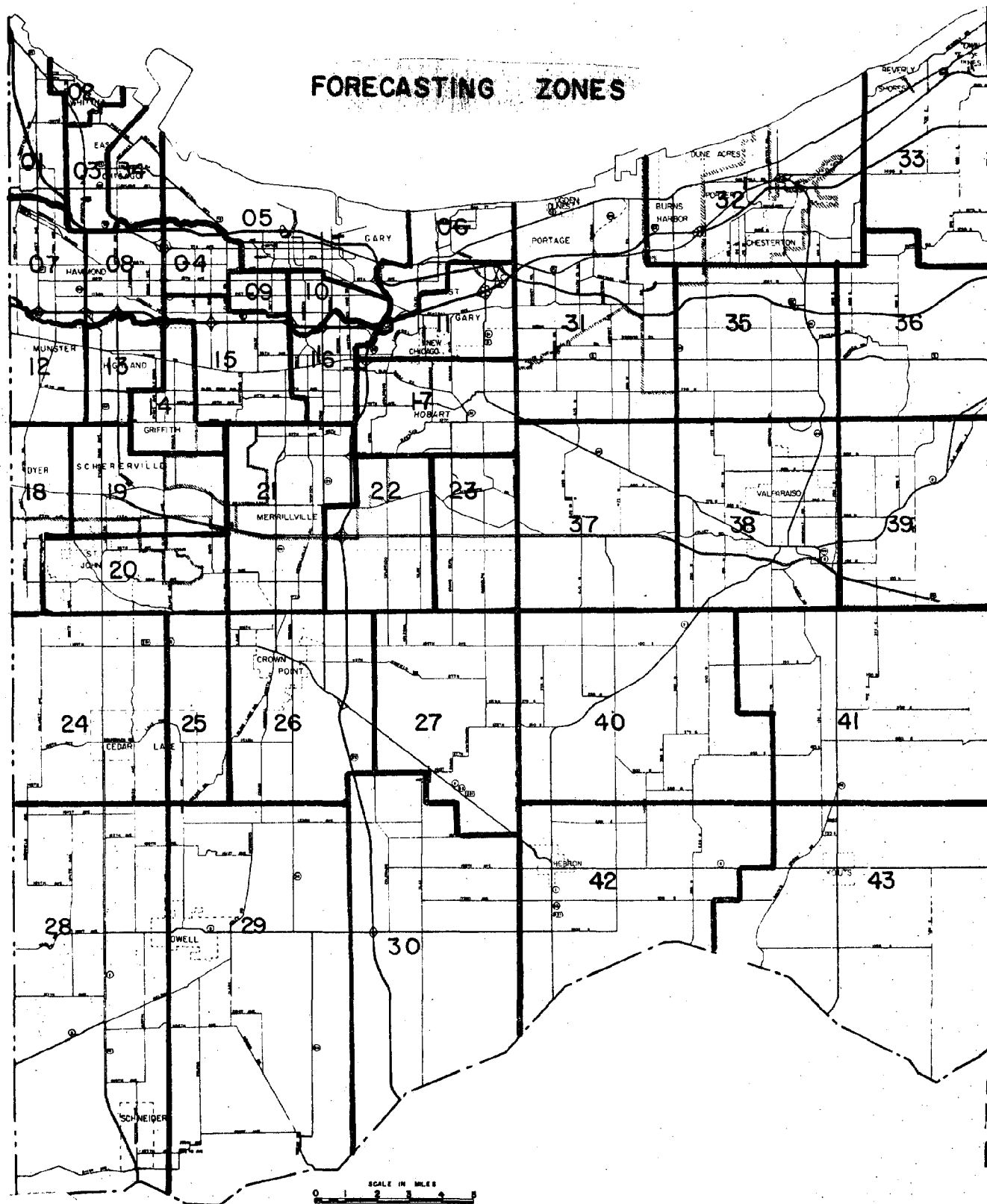


TABLE 3b : SUB-REGIONAL POPULATION FORECASTS

Zone	1960 Population	1970 Population	1980 Forecast	1990 Forecast	2000 Forecast	Zone
01	29,480	26,109	23,950	23,300	23,300	01
02	8,137	7,247	6,600	6,200	6,000	02
03	16,752	15,105	14,850	14,050	12,850	03
04	10,091	13,982	17,250	20,150	21,900	04
05	35,175	33,872	33,450	33,450	33,450	05
06	15,951	19,882	23,800	28,100	31,500	06
07	57,787	52,127	51,050	51,050	51,050	07
08	24,431	29,554	32,950	32,950	32,950	08
09	21,398	25,721	25,650	25,650	25,650	09
10	62,522	49,366	40,950	38,250	38,250	10
11	18,794	18,656	19,150	19,750	20,250	11
12	10,313	16,514	22,050	27,450	31,150	12
13	16,284	24,947	31,000	34,750	35,200	13
14	9,511	18,210	24,700	29,500	31,100	14
15	23,055	22,745	23,500	24,350	25,250	15
16	33,209	32,592	32,700	32,950	33,600	16
17	20,429	21,781	25,500	26,900	30,050	17
18	4,973	6,393	8,900	12,900	17,200	18
19	4,114	5,543	7,600	10,650	13,750	19
20	3,167	4,851	7,450	11,300	15,250	20
21	12,551	24,390	29,450	37,300	38,650	21
22	1,753	3,394	5,000	8,200	10,900	22
23	550	1,061	1,500	2,350	3,050	23
24	5,513	6,515	6,650	8,000	8,550	24
25	4,028	5,285	5,450	6,400	6,400	25
26	13,156	16,661	25,250	27,750	28,800	26
27	1,036	1,331	2,000	3,800	5,600	27
28	2,411	3,391	4,200	6,200	7,800	28
29	5,010	6,365	7,050	9,500	11,150	29
30	771	786	900	1,350	1,900	30
31	13,724	28,371	35,850	39,700	43,700	31
32	10,899	13,652	17,050	21,600	25,950	32
33	3,052	3,098	3,200	3,300	3,450	33
34	40,917	31,877	28,500	28,050	28,600	34
35	2,439	3,260	4,850	7,550	10,500	35
36	965	1,540	2,300	3,400	4,500	36
37	1,741	2,077	2,550	3,250	3,900	37
38	19,422	25,191	30,850	36,950	41,750	38
39	1,066	1,226	1,500	1,900	2,300	39
40	1,712	2,420	3,400	4,800	6,200	40
41	920	1,102	1,400	1,800	2,200	41
42	2,308	2,715	3,000	3,200	3,200	42
43	2,031	2,462	2,750	3,000	3,050	43
TOTAL	573,548	633,367	697,700	773,000	831,800	TOTAL

SOURCE: Northwestern Indiana Regional Planning Commission

later in this report are based on these forecasts, which also reflect the recommendations contained in the adopted regional goals, objectives and policies of the Commission. A detailed description of the methodologies utilized in formulating these population forecasts is provided in a series of six Commission reports.

Recently, the Indiana State Board of Health and the Indiana State Planning Services Agency adopted county level population projections prepared for the State Board of Health by the Division of Research, School of Business, Indiana University, Bloomington, Indiana. These forecasts, as well as forecasts for the CZM Townships are included in Appendix B.

Employment Forecasts

During three decades following 1970, employment is forecasted to increase from 234,700 to 344,400. This represents a gain of 110,000, or almost 50% above the 1970 total. Table 3c shows the forecasted increase by decade. The largest increase (40,000 or 17.0%) is forecasted to occur during the 1970-80 decade.

TABLE 3c : NON-FARM EMPLOYMENT FORECASTS FOR
NORTHWESTERN INDIANA

Year	Non-Farm Employment	Percentage Change
1960	206,500	---
1970	234,700	+13.7%
1980	274,500	+17.0%
1990	309,300	+12.3%
2000	344,400	+11.7%

Sources: Indiana Employment Security Division (1960 and 1970 estimates)
Northwestern Indiana Regional Planning Commission (1980 through
2000 forecasts)

Employment forecasts were developed through the use of a "shift-share" methodology, comparing national growth rates to those in northwestern Indiana. Tables 3d and 3e provide employment forecasts for non-farm industry for northwestern Indiana and the entire state.

TABLE 3d : NON-FARM INDUSTRY EMPLOYMENT FORECASTS
FOR THE STATE OF INDIANA

Year	Manufac.	Construc...	T.C.U.	Trade	F.I.R.E.	Serv.	Gov.	Other
1980	914,400	144,835	149,935	160,900	105,310	233,825	95,370	657,875
1990	1,013,620	160,550	166,205	178,360	116,740	259,200	105,715	729,265
2000	1,124,215	178,070	184,340	197,820	129,475	287,480	117,250	808,830

Source: U.S. Water Resources Council, OBERS Projections: Volume IV, 1972.

TABLE 3e : NON-FARM INDUSTRY EMPLOYMENT FORECASTS
FOR NORTHWESTERN INDIANA

Year	Manufac.	T.C.U.	Trade	F.I.R.E. & Serv.	Govern...	Other
1980	124,850	15,820	50,125	39,485	25,435	18,915
1990	141,965	16,405	57,735	46,485	26,605	19,080
2000	159,740	17,180	65,735	52,625	27,885	19,985

Source: Northwestern Indiana Regional Planning Commission.

Employment forecasts were allocated to sub-regional zones through the use of a methodology which involves the separation of types of employment into two categories -- those which are sensitive to patterns of population growth (regional market-oriented) and those which are not (export-based). Forecasts for the former are dependent upon population forecasts, while those for the latter are largely determined by existing employment patterns. The sub-regional employment forecasts and the 1970 employment total for each zone are shown in Table 3f. Appendix B includes employment forecasts for non-farm industries for the CZM townships.

TABLE 3f : SUB-REGIONAL EMPLOYMENT FORECASTS¹

Zone	1970 Employment	1980 Forecast	1990 Forecast	2000 Forecast	Zone
01	9,810	10,000	10,250	10,500	01
02	5,605	5,300	5,150	5,000	02
03	21,609	22,200	22,500	22,700	03
04	4,835	5,900	6,500	7,100	04
05	54,746	56,000	57,500	58,900	05
06	3,629	4,500	5,500	6,400	06
07	22,406	23,000	23,500	24,000	07
08	7,069	9,500	11,000	13,000	08
09	1,580	1,600	1,600	1,600	09
10	7,009	7,000	7,000	7,000	10
11	1,381	1,600	1,800	2,000	11
12	4,787	6,300	8,600	10,200	12
13	4,442	5,900	7,400	8,400	13
14	2,157	3,900	5,200	6,400	14
15	3,836	4,200	4,600	5,000	15
16	4,259	4,500	4,800	5,100	16
17	2,468	3,600	4,200	4,800	17
18	1,416	2,200	3,000	3,800	18
19	1,754	2,500	3,800	5,200	19
20	380	700	1,500	2,750	20
21	3,792	7,500	9,200	10,800	21
22	170	5,500	8,400	11,000	22
23	43	50	50	75	23
24	508	850	1,100	1,400	24
25	364	500	650	800	25
26	3,030	4,000	5,500	7,000	26
27	148	175	200	225	27
28	455	750	1,250	1,750	28
29	1,121	1,500	2,400	3,700	29
30	0	0	25	25	30
31	4,532	8,000	12,200	16,500	31
32	9,456	14,900	17,700	23,200	32
33	127	125	125	125	33
34	33,033	34,200	34,750	35,000	34
35	142	200	275	400	35
36	55	100	150	200	36
37	73	100	125	150	37
38	10,581	14,000	16,500	19,000	38
39	287	850	1,300	2,100	39
40	55	75	100	125	40
41	27	25	25	25	41
42	249	375	450	500	42
43	211	325	425	450	43
TOTAL	233,637	274,500	308,300	344,400	TOTAL

¹Non-farm employment

SOURCE: Northwestern Indiana Regional Planning Commission

These forecasts show some decentralization of employment. In 1970, over 80 percent of the region's jobs were located in North and Calumet Townships. During the 1970 to 2000 period, five zones outside these two townships -- zones 21 and 22 in Ross Township in Lake County, as well as zone 31 (Portage Township), zone 32 (Westchester Township) and zone 38 (Center Township) in Porter County -- are forecasted to receive almost 47 percent of the new employment in the SMSA.

LAND USE AND OWNERSHIP SURVEY

LAND USE INVENTORY

In 1971 the Northwestern Indiana Regional Planning Commission undertook a comprehensive, parcel-level inventory of the land use in Lake and Porter Counties. This inventory was updated in 1975. The same procedures were used for both the original inventory and the update. In most cases, a windshield survey was employed; in a few municipalities which had ongoing land use surveys at that time, data from those surveys was utilized. Once the land use data was collected, it was processed and translated into a numerical code.. In the interest of standardization, the Commission utilized the three-digit-level land use code published in the Standard Land Use Coding Manual, Housing and Home Finance Agency and the Bureau of Public Roads, First Edition, 1965. Certain modifications were made to the residential codes to allow for an improved definition of land use.

The three-digit-level land use data was coded and compiled on maps at the scale of one inch equals four hundred feet. Land use data at the three-digit-level is separated into approximately three-hundred separate categories. For purposes of measuring and quantifying the land use data, it was aggregated into twenty-four categories and also compiled on maps at the scale of one inch equals four hundred feet. To measure and quantify the coded data from the inventory, as aggregated, a dot sampling technique was utilized. The dot sampling method extracted a "stratified systematic unaligned sample" from the mapped land use data.

Land use inventory data, in twenty-four aggregated categories, was produced for each quarter-square mile area in the two-county region. These twenty-four categories are itemized in Table 4a.

The data has been computerized and is capable of being machine aggregated to produce land use data by category, for a variety of geographic areas.

TABLE 4a: TWENTY-FOUR LAND USE CATEGORIES

Category Number	Land Use	Category Number	Land Use
1.	Residential (single family)	13.	Cemeteries
2.	Residential (multiple family)	14.	Entertainment Assembly
3.	Residential (mobile home park)	15.	Public Buildings
4.	Manufacturing & Processing	16.	Public & Quasi-Public Open Space
5.	Transportation, Communication & Utilities	17.	Mining & Quarries
6.	Rail Rights-of-way	18.	Vacant, Agriculture & Forest
7.	Airports	19.	Vacant (under development)
8.	Streets	20.	Water (excluding public open space)
9.	Trade	21.	Warehousing & Storage Structures
10.	Services (private)	22.	Shopping Centers (including parking)
11.	Services (institutional)	23.	Hotels, Motels & Transient Lodging
12.	Military	24.	Parking (independent)

The quarter section file was used to generate the preliminary township data for the CZM study area presented in TABLE 4b. The tabulations are accurate to within .0143%, as some modifications are still required in the quarter section file.

A complete account of the procedures followed in conducting the land use inventory (data coding, mapping, compiling and tabulating) has been published by the Commission in a 1975 report entitled Methods and Procedures for the 1975 Land Use Inventory Update.

Land Use Categories

The twenty-four land use categories, as aggregated, provide a readily discernible and easily utilized summary of the literally thousands of actual uses of land. As mentioned previously, a list of these twenty-four land use categories is provided in TABLE 4a. It is often desirable to obtain an even

TABLE 4b TOWNSHIP SUMMARY LAND USE DATA

LAKE COUNTY	Residential Land Use		Commercial Land Use		Industrial Land Use		Institutional Land Use		Recreational/Open Space		Vacant/Ag Land Use		TCU Land Use		Total	
	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent
Calumet	8,941.20	(22.71)	1,235.85	(3.14)	4,218.54	(10.71)	1,113.92	(2.80)	911.49	(2.31)	14,357.88	(36.50)	8,596.77	(21.83)	39,375.65	100
Center	2,823.34	(11.08)	163.28	(.64)	29.58	(.12)	198.76	(.78)	1,604.87	(6.30)	19,391.09	(76.13)	1,261.91	(4.95)	25,472.83	100
Hobart	3,491.21	(21.06)	306.92	(1.85)	45.21	(.27)	400.24	(2.44)	153.97	(.93)	9,920.53	(59.83)	2,258.26	(13.62)	16,576.34	100
North	8,299.06	(24.04)	1,402.24	(4.06)	6,166.11	(17.86)	1,122.48	(3.25)	1,149.13	(3.33)	8,512.74	(24.65)	7,877.58	(22.81)	34,529.34	100
Ross	3,447.60	(11.15)	579.28	(1.87)	65.07	(.21)	610.04	(1.97)	1,006.35	(3.25)	23,089.53	(74.64)	2,135.11	(6.91)	30,932.98	100
St. John	2,932.85	(11.65)	279.73	(1.11)	146.16	(.58)	361.17	(1.44)	358.56	(1.43)	19,312.13	(76.75)	1,770.78	(7.04)	25,161.38	100
TOTAL	35,215.95	(11.03)	4,190.25	(1.32)	10,969.89	(3.44)	4,099.40	(1.28)	6,098.51	(1.91)	230,428.67	(72.16)	28,329.27	(8.87)	319,331.94	100
PORTER COUNTY																
Center	2,660.78	(14.74)	267.57	(1.48)	79.02	(.44)	316.04	(1.75)	504.63	(2.90)	12,692.51	(70.31)	1,531.34	(8.48)	18,051.89	100
Jackson	827.99	(5.14)	21.08	(.13)	34.16	(.21)	5.86	(.04)	43.82	(.27)	13,855.25	(86.02)	1,319.68	(8.19)	16,107.84	100
Liberty	1,001.33	(6.27)	33.55	(.21)	43.07	(.27)	54.02	(.34)	64.64	(.40)	13,680.52	(85.60)	1,105.57	(6.91)	15,982.70	100
Pine	599.52	(3.49)	67.80	(.39)	37.13	(.22)	30.86	(.18)	2,664.19	(15.51)	12,673.60	(73.77)	1,105.83	(6.44)	17,178.93	100
Portage	3,588.24	(16.78)	211.75	(.99)	780.34	(3.64)	339.05	(1.58)	815.41	(3.84)	13,164.94	(61.56)	2,484.03	(11.61)	21,383.76	100
Union	883.81	(4.67)	21.08	(.11)	23.29	(.12)	10.55	(.06)	64.95	(.34)	16,784.99	(88.60)	1,155.23	(6.10)	18,943.90	100
Westchester	2,091.27	(10.38)	180.84	(.90)	1,846.36	(9.17)	167.08	(.83)	5,447.86	(27.05)	8,624.62	(42.83)	1,779.32	(8.84)	20,137.35	100
TOTAL	15,475.48	(5.93)	947.48	(.36)	3,075.31	(1.18)	1,003.64	(.39)	9,770.50	(3.75)	215,423.81	(82.59)	15,136.56	(5.80)	260,832.78	100

SOURCE: Northwestern Indiana Regional Planning Commission, 1975 Land Use Inventory

more general description of land use. For these purposes, the twenty-four land use categories have been aggregated into eight highly generalized land use categories: residential; commercial and services; industrial; institutional; recreation/open space; vacant/agricultural; transportation, communication and utilities; and streets/parking. The remaining sections of this chapter provide a brief description of each of the eight aggregated land use categories. The map on page 42 shows land use in the CZM study area by the eight land use categories.

Residential Land Use









Residential areas are generally thought of as the hub or core of activities within and around a community. As such, they are the nucleus of a community. Therefore, it is desirable to plan for residential areas within easy access of necessary services and facilities such as schools, churches, employment centers, recreation areas, and retail shopping areas.

Residential land use refers to those areas which are primarily utilized and/or restricted to the use of occupied living accommodations. It includes such uses of land as detached single family dwellings, apartments, townhouses, duplexes, condominiums and mobile homes.

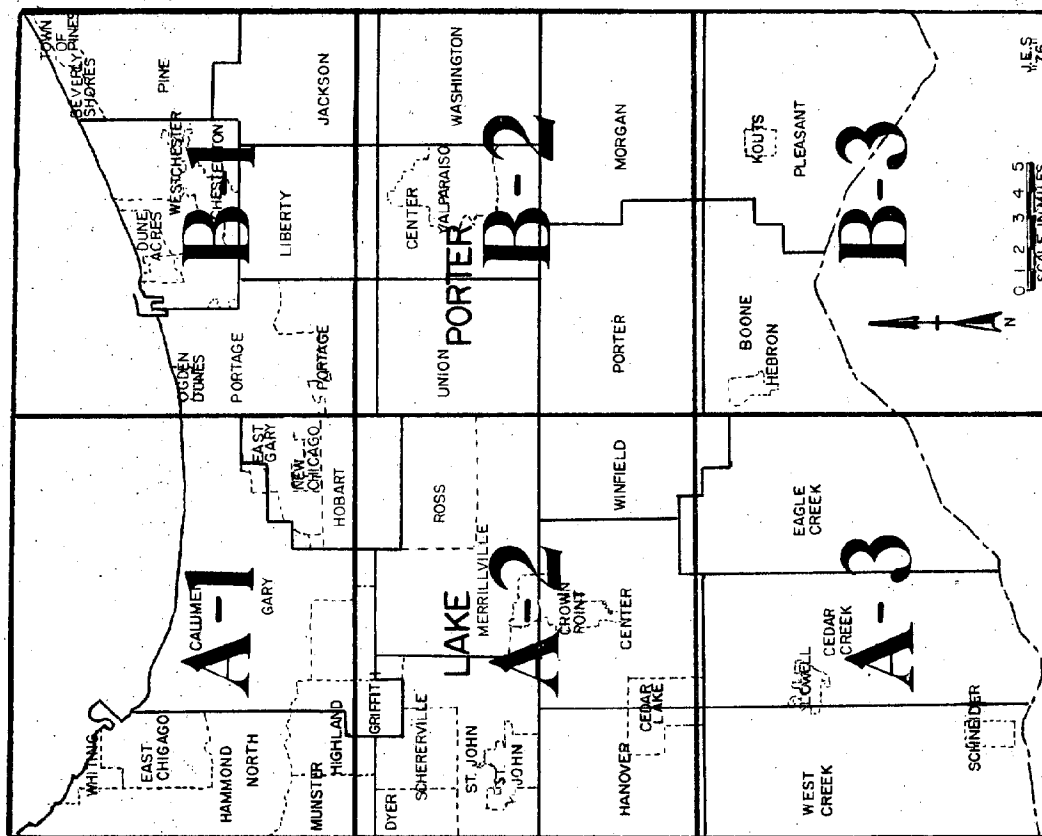
Commercial Land Use

There is a wide diversity in the types of commercial land use in northwestern Indiana. These uses range from small neighborhood grocery stores to multi-million dollar retail complexes. Commercial land use refers to the aggregate of a number of specific land use types including: 1) all wholesale and retail trade facilities; 2) finance, insurance and real estate services; 3) personal services such as beauty and barber services; 4) all business services excluding warehousing and storage services; 5) all repair, government, professional and contract construction services excluding religious

LEGEND

- | | |
|---|---|
| LOW DENSITY RESIDENTIAL |  |
| HIGH DENSITY RESIDENTIAL |  |
| COMMERCIAL & SERVICES |  |
| INDUSTRY & EXTRACTIVE |  |
| INSTITUTIONAL |  |
| PUBLIC & QUASI PUBLIC OPEN SPACE |  |
| TRANSPORTATION, COMMUNICATION,
UTILITIES |  |
| VACANT & AGRICULTURAL |  |

**Northwestern Indiana
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The preparation of this map series was financed in part through a grant from The National Oceanographic and Atmospheric Administration of the United States Department of Commerce.

EXISTING LAND USE MAP SERIES
TO BE INSERTED HERE

services; 6) animal husbandry, horticulture, forestry and fishing activity services; 7) all public assemblies (sports and entertainment) excluding auditoriums and exhibition halls; 8) all shopping centers (including parking); and, 10) hotels, motels, and transient lodging.

Industrial Land Use

Industrial areas provide the backbone of a region's economy. Northwestern Indiana's economy is primarily based on manufacturing and processing industries. While there is some degree of industrial diversity, the region's economy is largely oriented to the manufacturing and processing of primary metals and, to a lesser extent, oil refining.

Industrial land use is defined to include: 1) manufacturing and processing facilities; 2) warehousing and storage facilities; 3) agricultural processing; and, 4) the means of resource extraction (mining).

Institutional Land Use

This category of land use includes: public buildings, governmental offices, educational facilities, military installations, and cemeteries. This category represents public and quasi-public uses of land for other than recreation/open space purposes.

Recreation/Open Space Land Use

The preservation and management of sufficient open space within an urban environment is an important element in the provision of adequate recreational opportunities, in the preservation of natural resources, and in planning for and guiding future urban growth. Preserving and managing sufficient public open space areas is an important component in the relationship between man and his environment.

Recreational/open space land uses refers to a diverse list of specific land uses including: botanical gardens, arboretums, zoos, amusement areas,

golf courses, all outdoor recreational facilities, resorts and group camps, park areas, and cultural and nature exhibits.

Vacant and Agricultural Land Use

Nearly eighty percent of the region's area has been identified as vacant or agricultural land. By definition, vacant and agricultural land includes: croplands, farms and ranches, non-commercial forested areas, undeveloped or unused land in urban areas, vacant land under development and water areas. This category of land use provides the stock of land from which most future developments will draw.

Transportation, Communication and Utilities Use

This land use category, which will be abbreviated as TCU, is composed of a number of more specific land use classifications, which relate to providing: (1) the means for the movement of people and goods (transportation); (2) the facilities for the productive interaction among people (communication); and, (3) the services necessary to sustain life in an essentially urban environment (utilities).

Streets and Parking Land Use

Expressways, arterial highways, collector/distribution streets, local access streets, alleys and automobile parking areas which are not directly associated with another land use, are the uses of land which comprise this category. Streets and highways provide the basic mode of connection between other land uses within the urban landscape. For mapping purposes, streets and parking land use have been included in the TCU category.

SUMMARY OF OWNERSHIP SURVEY

The major private industrial owners of land in the CZM study area are identified on Table 4c. United States Steel, with almost 3,700 acres, is the largest owner, followed by Inland Steel, American Oil, Youngstown Sheet and Tube Company and Bethlehem Steel. Other major industrial owners include the E.I. DuPont DeNemours Company, Standard Oil, Cities Service Oil, Sinclair Refinery, Midwest Steel, and NIPSCO.

The federal government is the major public land owner. Most of the 3,533.6 acres it owns are contained in the Indiana Dunes National Lakeshore. The majority of State owned property is in the Indiana Dunes State Park and the Port of Indiana - Burns Harbor. Most of this government-owned land is in Porter County.

The 1,211.6 acres identified as county-owned land are located in the southern portion of the CZM study area. Most of the land owned by Lake County is in Center Township. Porter County-owned land is mostly in their Center Township. Neither county owns property on the lakeshore.

Individual municipalities owning land in the immediate lakeshore area include Whiting, East Chicago, Hammond and Gary. Their combined acreage totals 1,751.2 acres. The towns of Ogden Dunes, Beverly Shores and Pines, Dune Acres, and the Miller area of Gary, are all located on the shores of Lake Michigan. However, all of this land is privately owned, the only large tracts within the study area that are. Table 4d provides a summary of publicly owned land. The map on page 47 shows ownership for the immediate coastal area.

TABLE 4c : INVENTORY OF MAJOR PRIVATE INDUSTRIAL OWNERS
CZM STUDY AREA

OWNER	ACRES (appr.)
United States Steel	3,700
Bethlehem Steel	2,670
Inland Steel	2,800
National Steel (Midwest)	800
Youngstown Sheet & Tube	740
American Oil	985
Standard Oil	607
E. I. DuPont DeNemours	440
NIPSCO	650
Cities Service Co.	345
Sinclair Refining	201

Source: Lake and Porter County Plat Books

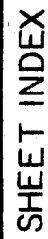
TABLE 4d : INVENTORY OF PUBLICLY OWNED LAND
CZM STUDY AREA

OWNER	ACRES (appr.)
Federal Government	3,533.6
State Government	3,500
Municipal Government	1,751.2
County	1,211.6

Source: Lake, Porter County Plat Books; Indiana Dunes National Lake Shore
Office.

LEGEND

PRIVATE INDUSTRY
PRIVATE (OTHER)
FEDERAL
STATE
COUNTY
MUNICIPAL



The preparation of this map series was financed in part through a grant from The National Oceanographic and Atmospheric Administration of the United States Department of Commerce.



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OWNERSHIP MAP SERIES
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Current Housing Stock

The availability of sound, sanitary, decent and affordable shelter for every citizen is a crucial social and economic need. For a healthy quality of life and to ensure a growing region, every household and potential household in northwestern Indiana must be able to secure adequate housing.

Satisfying this need requires a supply of housing sufficient to meet the needs of each household according to its income and size and its locational requirements. It means an adequate housing stock and a healthy housing market to enable a single household to find suitable shelter as it passes through its entire life cycle--as its needs change due to changes in income, age and membership. It also means sufficient opportunities for those who wish to be homeowners. Finally, it involves the availability of shelter which is not deteriorated, has a decent environment, and which is provided adequately with basic urban services.

A description of the region's housing stock by structural type is shown in Table 5a. This table includes U. S. Census Statistics for 1960 and 1970, as well as 1975 estimates developed through the Northwestern Indiana Regional Planning Commission's housing monitoring program. The major trend evident from Table 5a is the increase in the share of the housing stock represented by multi-family units with five or more units per building (from 9.1 percent in 1960 to 13.9 percent in 1975). Table 5b contains a description of the 1970 housing stock by tenure, as well as homeowner and rented vacancy rates.

TABLE 5a: ALL YEAR-ROUND HOUSING UNITS, 1960-1975

Units per Structure	1960 Number (Percent)	1970 Number (Percent)	1975 Number (Percent)
One ¹	121,964 (72.1%)	138,381 (71.8%)	149,418 (70.1%)
Two	16,820 (9.9%)	17,981 (9.3%)	18,803 (8.8%)
Three or Four	14,932 (8.8%)	14,884 (7.7%)	15,305 (7.2%)
Five or More	15,323 (9.1%)	21,444 (11.1%)	29,734 (13.9%)
Total	169,049	192,690	213,260

¹Includes mobile homes.

Sources: U.S. Census of Population and Housing (1960 and 1970 counts).
Northwestern Indiana Regional Planning Commission (1975 estimates).

TABLE 5b: TENURE AND VACANCY STATUS OF HOUSING UNITS, 1970

	Owner Occupied Units	Homeowner Vacancy Units	Renter Occupied Units	Rental Vacancy Units
Lake County	106,760	0.8%	53,264	6.4%
Porter County	19,094	1.1%	5,531	4.4%
Total	125,854	0.8%	58,795	6.2%

Source: U.S. Census, General Housing Characteristics: Indiana, HC(1)-A16
Ind., 1970, Table 13.

Housing units by townships for the CZM study area from the 1970 Census and the estimates of current units (1975) are presented on Table 5c. The highest rates of increase in the number of housing units for the 1970-1975 period were 53.0 percent in St. John Township and 38.7 percent in Union Township. The most developed areas of Lake County, Calumet and North Townships, show increases of 6 percent and 4 percent respectively. Porter County townships show generally higher rates of increase. The most developed areas of Center and Westchester Townships added 13.7 percent and 11.8 percent more units, and Portage Township increased its housing by 2,316 units, or 30 percent.

TABLE 5c : HOUSING UNITS BY TOWNSHIPS, 1970-1975

	1970	1975	Percent Change 1970-1975
<u>LAKE COUNTY</u>			
Calumet	65,491	68,989	5.3%
Center	6,567	7,616	15.9%
Hobart	11,589	13,075	12.8%
North	65,247	68,114	4.3%
Ross	7,663	9,779	27.6%
St. John	4,416	6,776	53.0%
<u>PORTER COUNTY</u>			
Center	7,762	8,831	13.7%
Jackson	539	687	27.4%
Liberty	1,143	1,276	11.6%
Pine	1,085	1,148	5.8%
Portage	7,667	9,983	30.2%
Union	609	845	38.7%
Westchester	4,438	4,962	11.8%

Source: U.S. Bureau of the Census, 1970
 Northwestern Indiana Regional Planning Commission, Growth
 Monitoring - Population and Housing Monitoring, FY 1976.

Housing Needs

The housing needs described below result from two factors: (1) deficiencies in the region's housing stock, and (2) future growth in the region's population. Obviously, population forecasts directly determine the magnitude of the housing needs resulting from the second of these two factors. Needs due to the first factor result from current substandard housing units, as well as from units which will become substandard and units which will be lost to the housing stock in the future. The base year is 1970, and the three decades, 1980 through year 2000, represent the forecast period.

In addition to the total housing need, a need has been identified for housing units which are affordable by low and moderate income households. These are households whose incomes are 80 percent or less than the median income of the two-county area. This amounts to approximately one-third of the region's households. Table 5d below shows the percentage of the families in the CZM study area's sixteen cities and towns with a population over 2,500 in 1970 which are of low and moderate income according to this definition.

TABLE 5d : PERCENTAGE OF ALL FAMILIES THAT
ARE OF LOW OR MODERATE INCOME

<u>Municipality</u>	<u>Percentage</u>
Chesterton	28.2
Crown Point	24.8
Dyer	19.7
East Chicago	47.1
East Gary	36.8
Gary	42.9
Griffith	19.1
Hammond	32.9
Highland	17.4
Hobart	23.9
Munster	13.0
Portage	23.0
Porter	29.7
Schererville	23.4
Valparaiso	29.3
Whiting	34.4

Source: U.S. Census of Population and Housing
(1970)

Regional Housing Needs

During the 1970 to 2000 period, there will be a need for the construction or rehabilitation of 144,182 housing units. Of these, 71,784 should be units affordable by low and moderate income households. Table 5e shows these needs by decade. The 144,182 units represent a total equal to almost three-fourths the region's 1970 housing stock. (In 1970, there were 192,699

year-round housing units in northwestern Indiana.) If this seems high, it is because those units which will become substandard or will be lost to the housing stock through fire, demolition and other causes during 1970 to 2000 must be replaced.

TABLE 5e : HOUSING NEEDS IN NORTHWESTERN INDIANA, 1970 TO 2000

Decade	Total Housing Need	Low and Moderate Income Housing Need
1970-1980	45,382	23,017
1980-1990	50,814	24,864
1990-2000	<u>47,986</u>	<u>23,903</u>
TOTAL	144,182	71,784

The estimates of total housing needs result from the following factors: (1) deficiencies in the 1970 housing stock due to substandard conditions, overcrowding and additional needed vacancies; (2) units which will be needed to house the future population growth; and (3) current, standard units which will become substandard or will be lost to the housing stock during the forecast period. U.S. Census Statistics were used to calculate the 1970 deficiencies. Population forecasts were used to develop estimates for units needed to house the additional future population, given appropriate assumptions for average household size. Past trends were analyzed to develop an estimate of the percentage of the 1970 housing stock which will have to be replaced in the future. The complete methodology for the calculation of all the housing needs estimates contained in this chapter is described in the Northwestern Indiana Regional Planning Commission report, A Summary of the Housing Component for the Comprehensive Regional Plan. (Northwestern Indiana RPC, 1975)

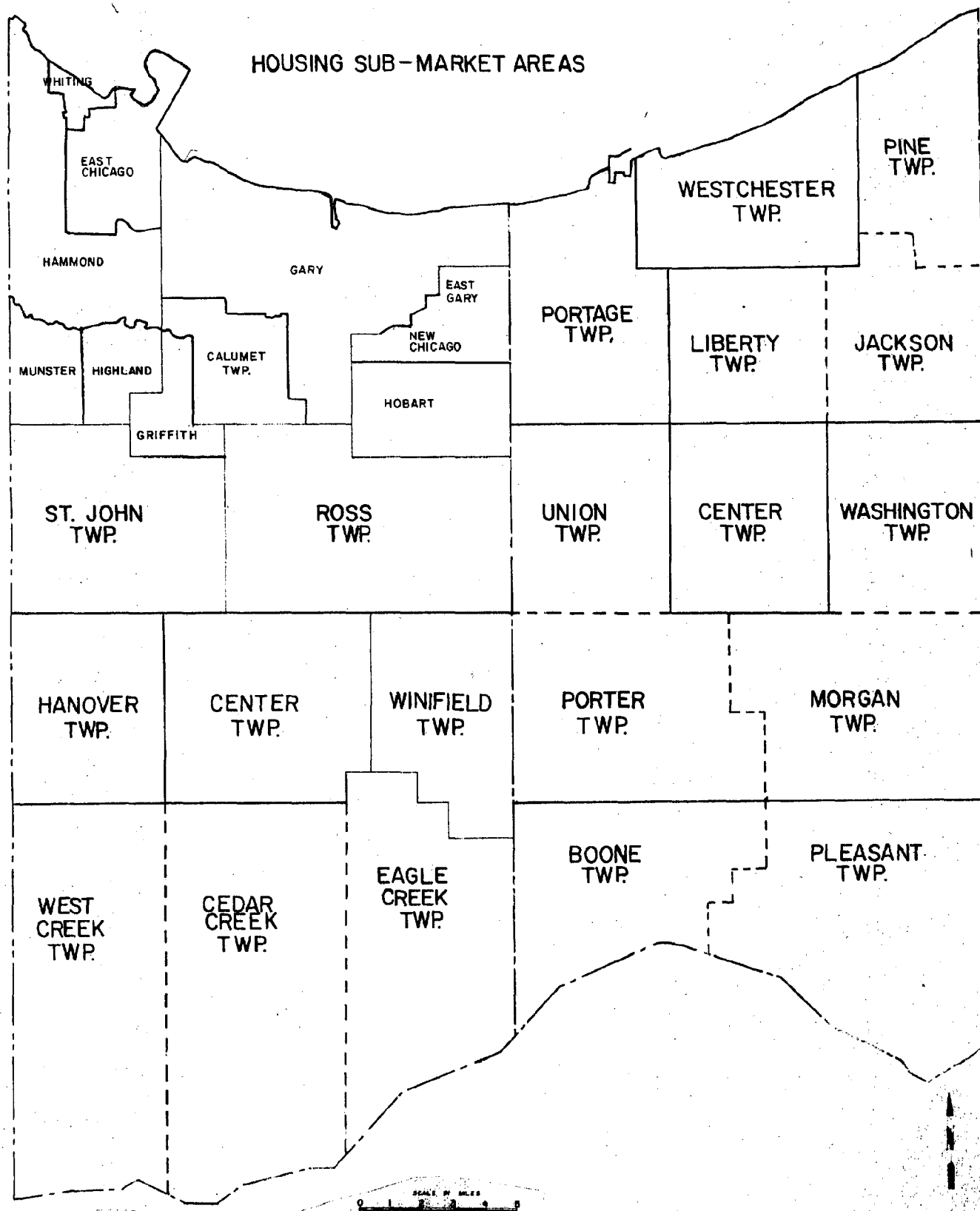
Low and moderate income housing needs were formulated using a method similar to the one described above. However, one additional factor was used in the calculation of 1970 deficiencies--the cost of housing. The number of

low and moderate income households living in adequate housing but paying more than 25 percent of their incomes in rent was included in the estimates of need. Low and moderate income housing needs can be met through the assistance given to low and moderate income residents of current standard units priced above the low and moderate income range, as well as through new construction or rehabilitation. They can also be met through the filtering process, in which the movement of a middle income household from a housing unit priced within the low and moderate income range can make that available to a low and moderate income family. This is especially important in northwestern Indiana, where middle income households live in a large portion of the housing stock which is priced within the low and moderate income range, according to 1970 census data.

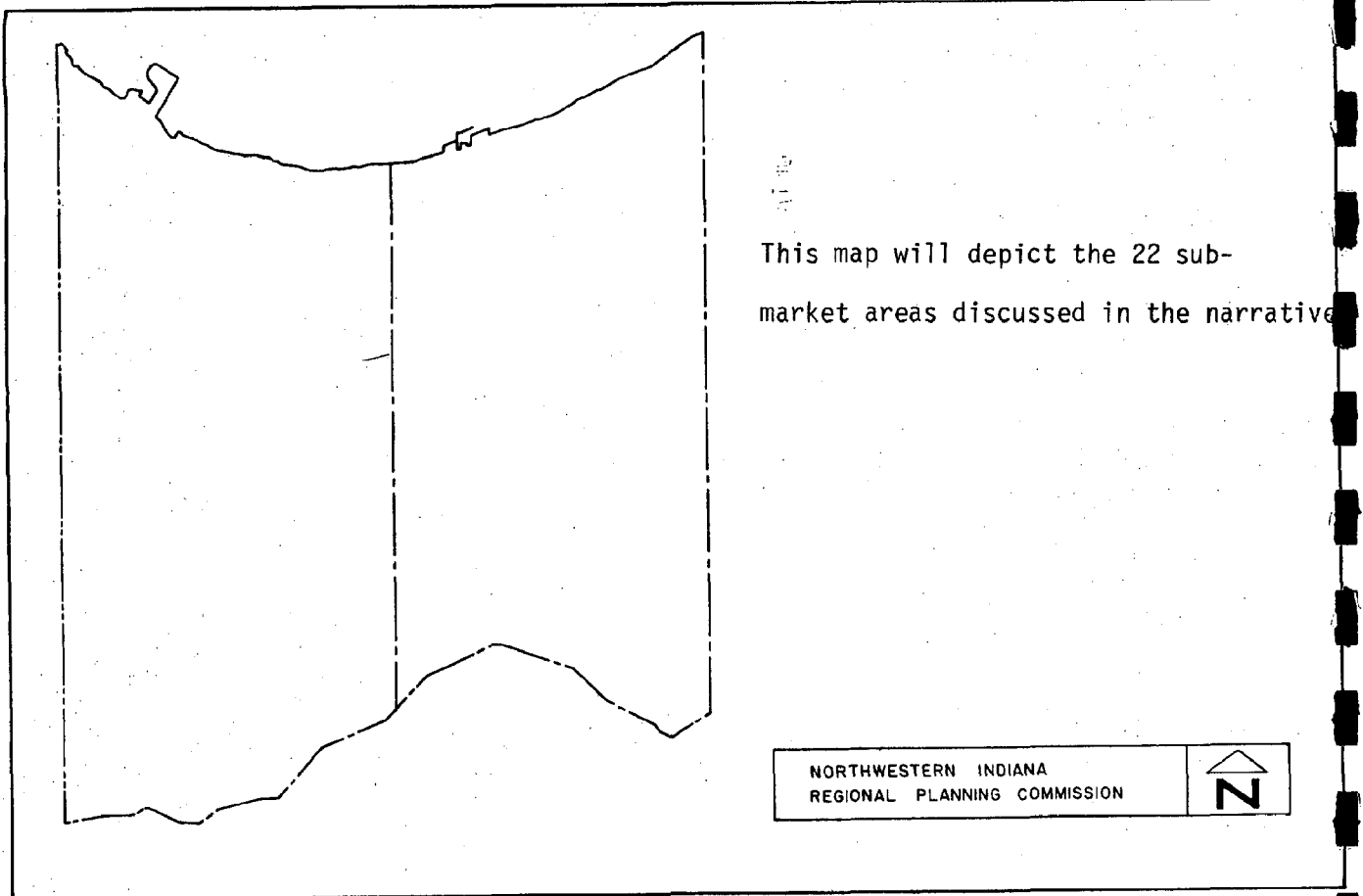
Sub-regional Housing Needs

In order to provide sub-regional estimates of housing needs, 22 sub-market areas were delineated. In delineating these sub-markets, an attempt was made to allow for the development of estimates by municipality, where possible. In several cases, the availability of forecasts and/or base data prevented this. A map of the 22 sub-market areas is on page 54.

Estimates of housing needs for the 22 sub-market areas were generated in a manner similar to that used to develop regional housing needs. The same two types of needs were generated: (1) total need for the construction or rehabilitation of housing; and (2) the need for additional standard housing affordable by low and moderate income households. Tables 5f and 5g show the needs, by decade, for these two types of needs, for all of northwestern Indiana. Table 5h shows the total housing need by decade, in the Coastal Zone townships. In some cases, the low and moderate income need may exceed the need for new construction or rehabilitation for specific sub-market areas in specific decades. This can occur when the needs due to low and moderate income households paying more than 25 percent of their incomes for housing overshadows



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of estimates by municipality, where possible. In several cases, the availability of forecasts and/or base data prevented this.

Estimates of housing needs for the 22 sub-market areas were generated in a manner similar to that used to develop regional housing needs. The same two types of needs were generated: (1) total need for the construction or rehabilitation of housing; and (2) the need for additional standard housing affordable by low and moderate income households. Tables III-D and III-E show the needs, by decade, for these two types of needs, respectively. In some cases, the low and moderate income need may exceed the need for new construction or rehabilitation for specific sub-market areas in specific decades. This can occur when the needs due to low and moderate income households paying more than 25 percent of their incomes for housing overshadows the needs due to current deficiencies, new growth and replacement.

TABLE 5a
SUB-REGIONAL LOW & MODERATE INCOME
HOUSING NEEDS: 1970-2000

	1970 L/M UNITS	1970-1980 L/M NEED	1980-1990 L/M NEED	1990-2000 L/M NEED
Gary	37,027	7,656	7,906	7,528
Hammond	21,835	3,269	3,392	3,186
East Chicago	10,348	2,994	3,081	2,868
Griffith	1,862	428	512	508
Highland	1,950	506	583	569
Hobart	3,628	497	559	530
Munster	740	386	461	467
Whiting	1,651	425	441	407
Center Twp. (Lake County)	3,121	728	832	813
Hanover Twp.	937	338	375	360
Ross Twp.	1,828	514	706	741
St. John Twp.	1,619	426	520	556
Winfield Twp.	115	189	216	210
Northern Hobart Twp.	3,920	489	522	495
Calumet Twp. (unincorporated)	2,890	811	868	823
Tri-Creek Area	1,281	433	486	492
Portage Twp.	3,452	548	663	670
Westchester Twp.	1,892	527	647	636
Center Twp. (Porter County)	3,583	951	1,066	1,045
Jackson, Liberty and Pine Twps.	894	347	391	384
Morgan, Porter, Union and Washington Twps.	623	291	339	333
Boone and Pleasant Twps.	714	264	298	282
TOTAL	105,910	23,017	24,864	23,903

Source: Northwestern Indiana Regional Planning Commission

the needs due to current deficiencies, new growth and replacement.

TABLE 5h : HOUSING NEEDS FORECASTS FOR CZM TOWNSHIPS

AREA	1970-1980	1980-1990	1990-2000
<u>LAKE COUNTY</u>			
Calumet	6,590	8,561	8,364
Center	5,046	2,134	885
Hobart	2,545	1,336	2,752
North	8,499	6,395	4,840
Ross	4,190	7,075	3,553
St. John	4,090	6,364	8,052
<u>PORTER COUNTY</u>			
Center	3,313	3,661	3,519
Jackson	324	558	740
Liberty	682	1,237	1,727
Pine	450	540	568
Portage	4,307	2,341	2,934
Union	341	476	548
Westchester	1,982	2,700	3,138

Source: Northwestern Indiana Regional Planning Commission.

Assistance to low and moderate income households paying more than 25 percent of their incomes in rent can increase the supply of housing available to low and moderate income households without adding to the total housing stock.

CULTURAL, HISTORICAL, AND EDUCATIONAL RESOURCES AND FACILITIES

The resources of northwestern Indiana include a broad range of activities, facilities and services. Within this discussion, cultural resources are grouped into historical and architectural and cultural facilities. In addition to the resources described here, northwestern Indiana has cultural resources which are less capable of being qualified or illustrated in the form of a list. Many of these resources are cultural activities organized around the region's numerous ethnic groups. These ethnic activities are of a wide variety, reflecting the diversity of the region's population.

Historical and Architectural Landmarks

Historically, northwest Indiana is relatively young. Baillytown, in northern Porter County on the Little Calumet River, the first settlement in the region, was established in 1822, six years after Indiana became the nation's nineteenth state. The transformation of the region from a terrain of marsh, prairie, dunes, and dense forest into the great industrial center of today is reflected in its historical and architectural landmarks. Early buildings like the Bailly (1822) and Wolf (1880) Homesteads in Porter County and the Woods Grist Mill and Ye Old Homestead in Lake County are landmarks of particular building styles. The region's historic structures range in type, from log cabin construction, as in Lake County's first church building in St. John, to structures built from clapboard, brick and stone.

Many landmarks are tied to the early industrial development of the region. Several grist mills mark the beginnings of local industry. The older lakeshore steel mills are particularly dramatic when viewed at night and have come to symbolize the entire region. In East Chicago there is Marktown, a planned community built in 1917 to house industrial workers.

This development, a registered national landmark, is interesting not only for its high quality urban design but also for the insight it gives into the social values of the turn-of-the-century industrialists.

The early, rural centers of the region, particularly Crown Point and Valparaiso, present a different architectural heritage. Early landmark buildings are clapboard and generally reflect a rural character. The Old Lake County Courthouse, located in central Crown Point, is a classic revival building considered to be one of Indiana's finest courthouses of the Victorian period. The building is a registered national landmark. Other buildings facing the square surrounding the courthouse reflect the character of a small midwestern county seat.

In Valparaiso, the Porter County Courthouse, Memorial Opera House, and Old Porter County Jail are architectural and historical landmarks that give identity and character to the city's central area. The old Valparaiso University campus features a scenic pedestrian mall lined with turn-of-the-century buildings.

As the region grows and develops, new edifices--the landmarks of tomorrow--rise from the landscape. The Valparaiso University Chapel is an example of dramatic and inspirational Church architecture. The Lake County Library in Hobart is a striking architectural accent overlooking Lake George. The Twin Towers Complex in Merrillville provides a vertical focal point in an area of rapid low-rise development. These landmarks, both the old and the new, physically reflect the character of northwest Indiana.

Cultural Facilities

The cultural resources of the region include several permanent art galleries in Hammond, Gary, Chesterton, Valparaiso, and Crown Point, as well as several annual art fairs sponsored by local art associations and individuals.

Several amateur theatrical groups present a variety of drama, comedy, and musical productions. Some groups are associated with colleges or universities, while others are independent community groups. A major cultural resource is the Northwest Indiana Symphony Orchestra, which offers a full season schedule of classical music and hosts internationally renowned guest artists.

Four permanent museums are located in the region, and exhibits of art and educational interest are displayed periodically at the colleges and universities. Several of the permanent museums are housed in landmark buildings. The Hobart Historical Society museum is in a Tudor revival style building that is one of the last Carnegie Libraries to be constructed in the country. A public museum is featured in Crown Point's first clapboard building, which was built in 1843. The Porter County Historical Museum is housed in former Porter County Jail, built in 1871 in two parts. The rear portion of this building was constructed of now rare Joliet stone.

Educational Resources

The two-county region is served by twenty-five public school systems which support 217 separate school facilities. Thirty-four of these are high schools, including two vocational-technical high schools. In addition, there are thirty-nine private schools in the area. Three of these are high schools.









Northwestern Indiana also offers opportunities for higher education. Seven universities and colleges -- Indiana University Northwest, Purdue University Calumet, Valparaiso University, Hyles Anderson College, Calumet College, Indiana Vocational Technical College and Valparaiso Tech provide certificate, associate, baccalaureate, and graduate curriculums in a broad range of disciplines, including education, engineering, law, business, and many others.

Both Lake and Porter Counties maintain public library systems. The Lake County system has fourteen locations, while the Porter County system has three. Additionally, nine communities have their own library systems. In all, there are forty-nine individual library facilities, as well as mobile units, serving the two-county area.

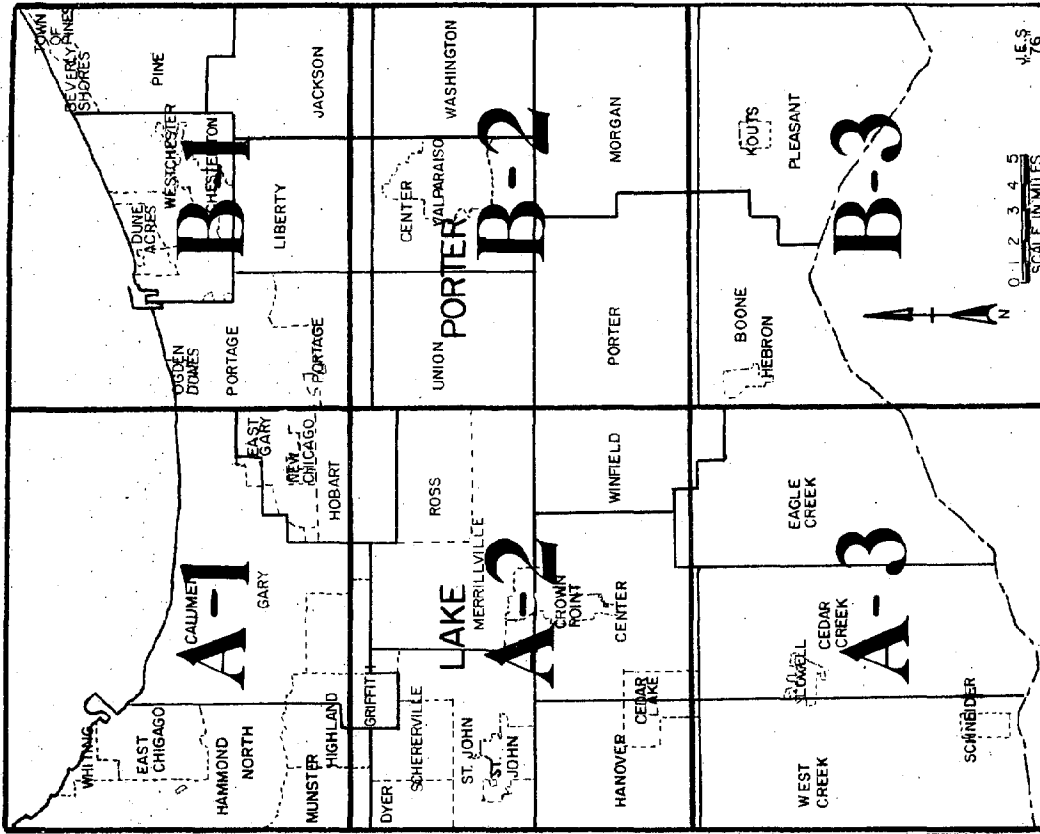
Appendix C lists the cultural, historical and educational resources and facilities and their locations. The exact location of each facility is shown on the map on page 62.

EDUCATIONAL, CULTURAL & HISTORICAL FACILITIES INVENTORY

LEGEND

PUBLIC HIGH SCHOOLS	
PUBLIC ELEMENTARY SCHOOLS	
PAROCHIAL SCHOOLS (ALL)	
COLLEGES OR UNIVERSITIES	
SPECIAL EDUCATION	
LIBRARIES	
HISTORIC SITES	
ART CENTERS & MUSEUMS	

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EDUCATIONAL, CULTURAL, AND HISTORICAL
FACILITIES INVENTORY MAPS
TO BE INSERTED HERE

RECREATIONAL RESOURCES AND FACILITIES

There are over 200 public parks and outdoor recreation facilities in Lake and Porter Counties. Most of these are provided by municipalities. Of particular note among municipal parks is Marquette Park in Gary, which features a lakeshore beach and scenic fishing lagoon with a picturesque Japanese-style bridge and Italianate pavilion. Other notable local parks include: Woodland Park in Portage, which includes a uniquely designed pavilion; Rogers Lakewood Park in Valparaiso, which offers a variety of water related activities, picnic facilities, and camping opportunities; and Wicker Park and Golf Course in Highland, which includes numerous recreation facilities in a wooded setting and is the only township-maintained park in the region.

The Lake County Parks and Recreation Department currently maintains three county parks and runs an ambitious county-wide recreation program. The region additionally contains the state-maintained Indiana Dunes State Park in Porter County. The Dunes State Park is estimated to be the most heavily used park facility in all of Indiana.

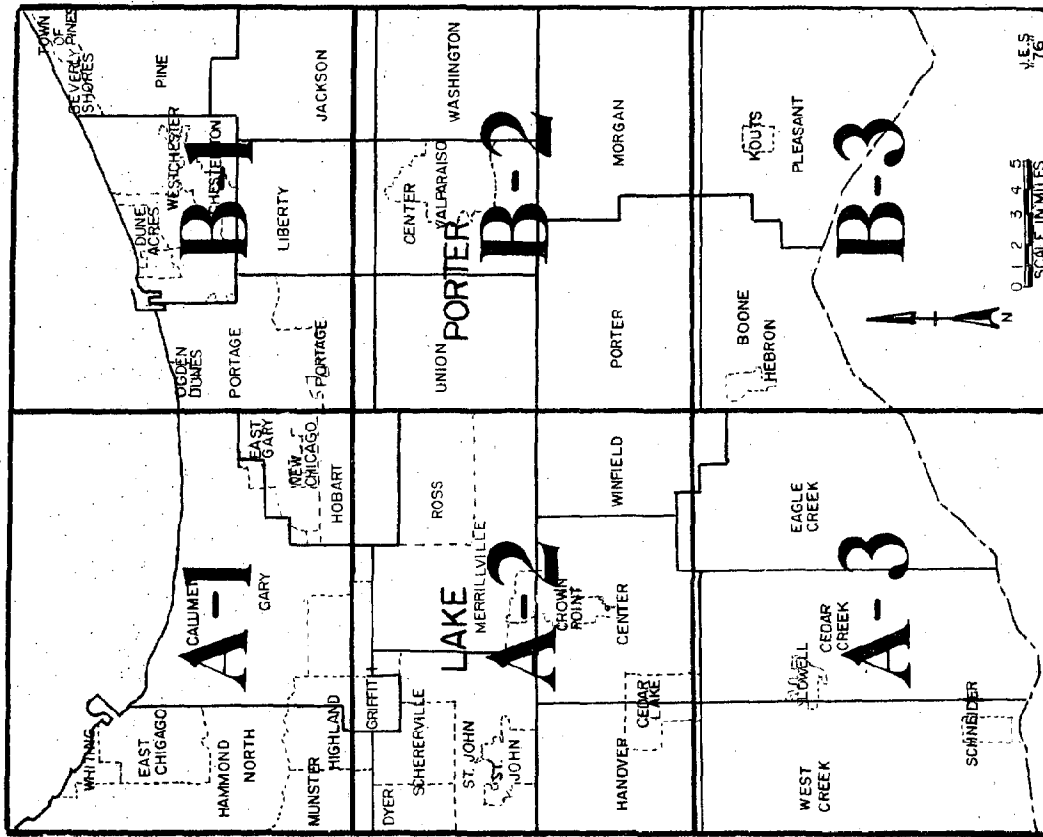
Also along the Lake Michigan shoreline is located the Indiana Dunes National Lakeshore, currently containing some 4000 acres of unique dunes land. This pioneer urban national park will offer facilities for both active and passive recreational activities. Congress recently authorized the addition of 3,660 acres into the National Lakeshore. However, as this property has not yet been acquired, it will not be considered as existing park land.

In all, there are over 13,400 acres of park acres currently provided to serve the recreational needs of the area's population. Appendix D lists the parks by municipality. The map on page 64 shows their exact location.

PARKS INVENTORY

LEGEND

RECREATIONAL OPEN SPACE



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PARKS INVENTORY MAPS
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Parks and Recreation Needs

The provision of sufficient open space and recreational opportunities for today's urbanizing environment is becoming more crucial as the pace of modern living increases. The use of active recreational facilities, as well as the opportunity for the urban resident to "get away from it all" in a natural setting, should be among the recreational choices available to all people. As leisure time increases for the general population, the use of existing park facilities becomes increasingly overburdened. This situation is compounded by the fact that potential park land is rapidly diminishing in the most urbanized areas, where the demand for such land and facilities is the greatest. Also, skyrocketing land values in developing areas have made it uneconomical for many desirable wooded sites to be purchased and developed for park purposes. These are some of the many problems facing governmental agencies responsible for meeting park and recreational needs.

If these growing needs are to be effectively addressed, a coordinated effort is required on the part of all governmental agencies responsible for providing parks and recreational facilities. If the entire spectrum of recreational opportunities -- from the provision of active recreational courts to the protection of large tracts of undeveloped natural areas -- is to be realized, then a consistent method for addressing park and recreational responsibilities is also needed.

The following discussion presents parks and recreation standards and relates them to current inventories of park land and recreational facilities, resulting in estimates of deficiencies in park land and recreational facilities.

Park and Recreational Standards

Acreage standards for park land have developed for three categories: federal and state, county, and municipal. Table 7a lists the standards for

each of these three. The federal and state acreage includes a wide range of parks, recreational areas, and preserves. The county standard is made up of twelve acres per 1,000 in "regional" parks and three acres per 1,000 in "district" parks. The municipal standard is divided into community, neighborhood and block parks.

TABLE 7a: RECOMMENDED PARK ACREAGE
STANDARDS BY JURISDICTION

Jurisdiction	Standard
Federal and State	20 acres/1000 population
County	15 acres/1000 population
Municipal	10 acres/1000 population

Recreational facility standards are categorized into active recreational facilities and specialized facilities. Table 7b shows these standards.

TABLE 7b: RECOMMENDED RECREATIONAL
FACILITY STANDARDS

Facility	Standard
<u>ACTIVE RECREATION</u>	
Baseball Diamonds	1 acre/6000 population
Softball Diamonds	1 acre/2000 population
Tennis Courts	1 acre/1000 population
Basketball Goals	1 acre/1000 population
Playgrounds	1 acre/1000 population
<u>SPECIALIZED</u>	
Picnicking	1 acre/1000 or 10 tables/1000
Community Centers	1 acre/25,000 population
Swimming Pool	1 acre/25,000 population
Artificial Ice Skating Rinks	1 acre/25,000 population
Golf Courses	1 acre/25,000 population

Park and Recreational Deficiencies

The above standards were used to generate estimates of deficiencies in regional park acreage and recreational facilities. Given the availability of the 1975 inventory of existing park acreages conducted by the Northwestern Indiana Regional Planning Commission, 1975 was chosen as the base year. Current park and recreational deficiencies were generated using the best possible estimates of 1975 population. Population forecasts for 1980 and the year 2000 were used to develop five-year and twenty-five-year deficiencies, respectively.

As shown in Table 7c, there is a need for an additional 23,001 acres of park land in northwestern Indiana by the year 2000. The current and five-year needs are 15,719 acres and 17,395 acres, respectively. The year 2000 need represents almost a 75% increase over the 1975 inventory.

TABLE 7c: REGIONAL PARK ACREAGE NEEDS
IN NORTHWESTERN INDIANA

Jurisdictional Level	Inventory	Acres Deficient		
		1975	1980	2000
Federal and State	8,965	4,255	4,995	7,675
County	1,377	8,538	9,093	11,103
Municipal	<u>3,021</u>	<u>2,926</u>	<u>3,307</u>	<u>4,223</u>
TOTAL	13,363	15,719	17,395	23,001

Table 7d shows the regional deficiency in recreational facilities for 1975, 1980 and the year 2000.

TABLE 7d: REGIONAL RECREATIONAL FACILITY
NEEDS IN NORTHWESTERN INDIANA

Facility	Intentory	Facilities Deficient		
		1975	1980	2000
<u>ACTIVE RECREATION</u>				
Baseball Diamonds	228	---	---	---
Softball Diamonds	214	117	135	202
Tennis Courts	262	179	204	293
Basketball Goals	717	---	---	115
Playgrounds	347	314	351	485
<u>SPECIALIZED</u>				
Picnicking	2,630	3,980	4,350	5,690
Community Centers	1	26	27	33
Swimming Pools	9	18	19	23
Artificial Ice				
Skating Rinks	15	7	9	13
Golf Courses	30	---	---	4

Source: Northwestern Indiana Regional Planning Commission.

COMMUNITY FACILITIES AND SERVICES

The community facilities and services of the region are typical of the types of such facilities and services in most urban areas. This chapter will briefly summarize these community facilities and services available to the residents of northwestern Indiana.

Public Health Facilities

There are ten hospitals and seven major group practice clinics within the CZM study area. Table 8a gives public health service statistics for Lake and Porter Counties. The location of the health facilities is shown on Table 8b.

Projections for 1980 health care needs developed by the Northern Indiana Health Systems Agency, Inc., indicate a bed surplus in both counties. Existing facilities are deemed adequate through the year 1985. Statistics on future needs for doctors are not available. Based on the national average of 885 people per doctor in 1973, Northwest Indiana ranks comparatively low, with 1,212 people per doctor in Lake County, and 1,054 in Porter County.

TABLE 8a : PUBLIC HEALTH
SERVICE STATISTICS

<u>CATEGORY</u>	<u>LAKE COUNTY</u>	<u>PORTER COUNTY</u>
Current Hospital Bed Capacity	2,746	438
Total Number of Doctors	514	72
Number of People Per Doctor	1,212	1,054
Projected Needs (1980) - Bed Capacity	2,046 (408 bed surplus)	337 (87 bed surplus)
Projected Needs - Doctors	NA	NA

Source: Northern Indiana Health Systems Agency, Inc., Draft Regional Health Plan, March, 1975.

TABLE 8b : PUBLIC HEALTH FACILITIES

Hospitals and Clinics	Location
<u>LAKE COUNTY - HOSPITALS</u>	
Broadway Methodist	Merrillville
Community	Munster
Methodist	Gary
Our Lady of Mercy	Dyer
St. Anthony	Crown Point
St. Catherine	East Chicago
St. Margaret	Hammond
St. Mary	Gary
St. Mary - S.E.	Hobart
<u>MAJOR GROUP PRACTICE CLINICS</u>	
Associates Medical Center	Gary
Hammond Clinic	Munster
Jones Clinic	Munster
Ross Clinic	Merrillville
Whiting Clinic	Whiting
Whiting Clinic	Hammond
<u>PORTER COUNTY - HOSPITALS</u>	
Porter Memorial	Valparaiso
<u>MAJOR GROUP PRACTICE CLINICS</u>	
Portage Medical Group	Portage

Source: Northern Indiana Health Systems Agency, Inc.,
Draft Regional Health Plan, March, 1975

Public Safety Services: Fire Protection

There are six professional fire departments in the region in Hammond, Gary, East Chicago, Whiting, Portage and Valparaiso. Most of the other municipalities and townships are served by volunteer fire departments. Local communities and unincorporated areas which do not have their own fire protection contract for fire service from surrounding communities. A list of fire departments, their manpower and location is presented in Table 8c.

TABLE 8c : 1976 FIRE DEPARTMENT STATISTICS - LAKE AND PORTER COUNTIES

CITY OR TOWN	LOCATION	MANPOWER
<u>LAKE COUNTY</u>		
Down Point	105 E. Clark	29
Over	226 Schulte Drive	50
East Chicago	450 E. Columbus Drive	
	3428 Guthrie Street	
	4525 Indianapolis Blvd.	
	149th & Kennedy Avenue	
	1225 W. 151st Street	
	2201 E. Columbus Drive	119 total
East Gary	3629 Central Avenue	50
Gary	200 E. 5th Avenue	
	1840 Adams Street	
	1200 Roosevelt Street	
	330 W. 25th Avenue	
	4101 Washington Street	
	1201 W. 5th Avenue	
	Miller Ave. & Huntington Street	
	2800 W. 5th Avenue	
	761 Clark Road	
	3325 Virginia Street	
	8010 Indian Boundary Road	
	1901 Mississippi Street	311 total
Griffith	115 North Broad Street	
Hammond	401 South Broad Street	33 total
	2211 Calumet Avenue	
	4751 Calumet Avenue	
	6110 Calumet Avenue	
	6217 Hohman Avenue	
	2716 E. 169th Street	
	1545 E. 173rd Street	
	3323 E. 165th Street	196 total
Highland	3333 Ridge Road	45
Hobart	454 E. 4th Street	
	W. Ridge Road	21 total
Merrillville	13 W. 73rd Avenue	
	7905 Taft Street	See Ross Township
Munster	805 Ridge Road	
	550 Fisher Street	50 total
New Chicago	127 Huber Road	24
St. John	11033 W. 93rd Avenue	30
Schererville	1640 Wilson Street	35
Whiting	1916 Schrage Street	19
<u>UNINCORPORATED AREAS</u>		
Calumet Township	Black Oak - 6066 W. 29th Avenue	42
Cross Township	Ainsworth - Old Lincoln Highway	128 total
St. John Township	Lake Hills - 9105 W. 85th Avenue	
	New Elliot - Highway 330	28
<u>PORTER COUNTY</u>		
Beverly Shores	Broadway Street	25
Burns Harbor	Covered by Porter	
Chesterton	726 Broadway	25
Dune Acres	Covered by Porter	
Edgen Dunes	Hillcrest Road	24
Town of Pines	1516 Maple	24
Fortage	6070 Central Avenue	27 and Chief
Porter	303 Franklin Street	13
Palparaiso	205 Indiana Avenue,	
	Evans Street	27 and Chief
Liberty Township	900 North Road	32
Pine Township	Covered by Town of Pines	
Portage Township	700 North at McCool Road	27
Union Township	Wheeler Fire Dept. - State Road 130	24

Sources: Lake and Porter County Fire Department Chiefs

Public Safety Services: Police Protection

Table 8d presents the location and manpower of the municipal police stations within the CZM study area, along with county and state police forces.

There are 24 municipal police departments in the region, in addition to two state police posts and each county's sheriff's department.

Additional security is provided on a limited basis by private industry, local universities, and the National and State Parks. Industries that maintain a security force include U.S. Steel, Youngstown Sheet and Tube Co., Standard Oil Refinery, Bethlehem Steel, Midwest Steel, and the Port of Indiana at Burns Harbor. Industrial security forces vary in size, from 15 or 20 to over 100 at the larger industries.

Area universities that maintain a security force include Indiana University Northwest, which has 10 police officers, Purdue University Calumet Campus, which has 7, and Valparaiso University, which also has 7 security guards.

The Indiana Dunes State Park has a security force of seven and the National Lakeshore Park employs eight people for security purposes.

The overall crime rate for Lake County is 5,537.4 crimes per 100,000 population. Similar statistics for Porter County are not available. Individual cities or towns that compile crime rate statistics include Gary, which has a rate of 6,495.1 per 100,000; Hammond, 6,885.9 per 100,000; East Chicago, 6,048.7 per 100,000; Portage, 5,370 per 100,000; and Valparaiso, 4,590 per 100,000. (The source of these crime statistics is the Comprehensive Plan: 1973 of the Lake County Criminal Justice Coordinating Council.)

TABLE 8d : PUBLIC SAFETY SERVICES:
POLICE PROTECTION (1976)

Jurisdiction	Location of Police Station	Manpower
<u>LAKE COUNTY</u>		
Crown Point	100 E. Clark Street	17
Dyer	226 Schulte Street	11
East Chicago	2301 E. Columbus Drive	147
East Gary	3628 Central Avenue	18
Gary	1301 Broadway	365
Griffith	115 North Broad Street	20
Hammond	5925 Calumet Avenue	
	2211 Calumet Avenue	212
Highland	3330 Ridge Road	30
Hobart	414 Main Street	26
Merrillville	13 W. 73rd Avenue	24
Munster	1050 Ridge Road	26
New Chicago	127 Huber Boulevard	7
St. John	11033 W. 93rd Avenue	7
Schererville	1640 Wilson Street	9
Whiting	1916 Schrage Street	30
Sheriff's Department	2293 North Main Street, Crown Point	83
Indiana State Police	Schererville	50
<u>PORTER COUNTY</u>		
Beverly Shores	Broadway	5
Burns Harbor	Boo Road	6 full-time 4 part-time
Chesterton	726 Broadway	14
Dune Acres		County Sheriff
Ogden Dunes	Hillcrest Road	1 and County Sheriff
Pines	1516 Maple	4 part-time and County Sheriff
Portage	2693 Irving	35
Porter	303 Franklin	5
Valparaiso	107 Jefferson	33
Sheriff's Department	157 Franklin, Valparaiso	44
Indiana State Police	U.S. 20 and S.R. 49, Westchester	50
Indiana Dunes National Lakeshore		8
Indiana Dunes State Park		7

Source: Local Police Department Chiefs

Solid Waste Disposal: Capacity and Needs

The present solid waste disposal system in Northwestern Indiana consists of a number of independent subsystems serving small portions of the region. Fourteen municipalities and 12 private firms collect solid waste within the two-county area. Besides the 14 municipal collection operations, 9 municipalities have contracted with private dealers for collection services within each community. The only transfer facility in the region is located in Hobart, to relieve the collection vehicles of long hauls to Valparaiso. The only significant processing facility is the East Chicago Incinerator. Of the 12 disposal sites operating at the time of the survey, July 1976, four are publicly operated and the rest are private.

A large portion of the industrial waste in Lake and Porter Counties is either inert slag or ash materials which are generally recycled or disposed of in company-run landfills. The steel industry and other industries in the two-county area also generate solid or non-solid wastes which would be hazardous if landfilled. Generally, these industries recognize the hazardous nature of their waste material and either pretreat it to render it harmless or dispose of it in their facilities, thus relieving the municipalities of the responsibility of disposal.

The locations of the major disposal sites serving the two-county area are shown in Figure 2. The numbers identifying each site are keyed to the summary presented in Table 8e, which details the site operations. The open circles in the figure denote landfill operations which have not received Approved Sanitary Landfill (ASL) designations from the State Board of Health, because of environmental inadequacies. The solid circles are the ASL designated landfills within the two-county area. The ASL designation signifies proper operating procedures controlling odors, blowing papers, disease vectors, blowing dust, and ground and surface water pollution.

EXISTING SOLID WASTE SYSTEM

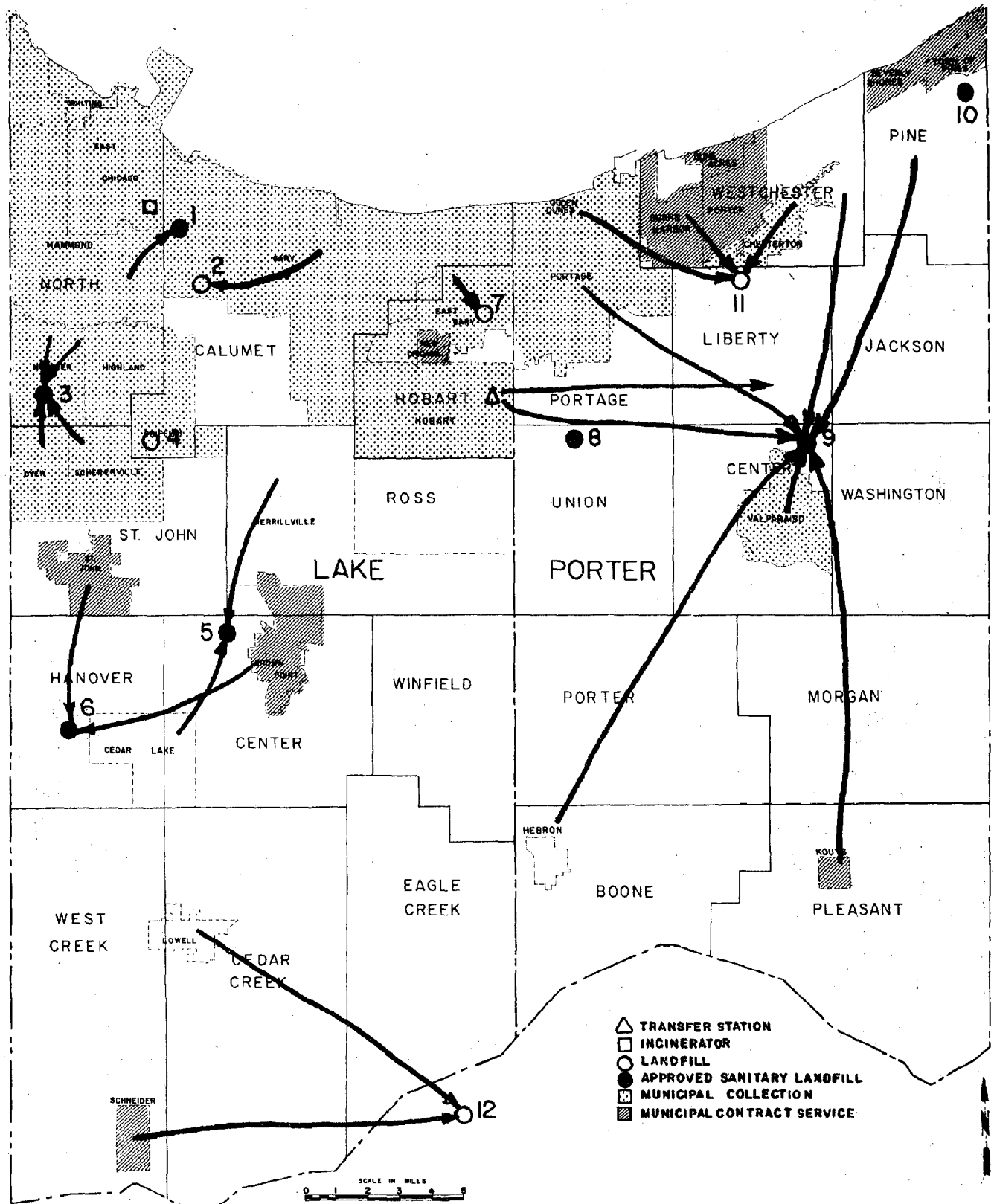


TABLE 8e : DISPOSAL SITES IN LAKE AND PORTER COUNTIES (1976)

Site Name	Owner or Operator
(1) Gary Landfill Development Co.	G. L. D. Co.
(2) Gary Landfill	City of Gary
(3) Munster Landfill	Town of Munster
(4) Griffith Landfill	Town of Griffith
(5) Center Township Landfill	Home Sanitation Service
(6) J & D Landfill - Cedar Lake	J & D
(7) East Gary	City of East Gary
(8) Best Way - Wheeler	Best Way Services
(9) Best Way - Valparaiso	Best Way Services
(10) Best Way - Pines	Best Way Services
(11) Dietz - Chesterton	Able Disposal Services
(12) Groen - DeMotte	Groen Bros. of Indiana

The handling of residential, commercial, and industrial wastes demands the greatest attention because it is of direct concern to most of the local governments. Projections indicate a 33 percent increase in this waste generation during the 1970 decade, with the greatest problems in the existing system occurring in the developing suburbs of central Lake County and northern Porter County. The approved sanitary landfills currently operating or soon opening to serve the region, contain sufficient capacity to satisfy the disposal needs of the region through 1985.

Electrical Supply: Capacity and Needs

Northern Indiana Public Service Company (NIPSCO) supplies electricity to the northern third of Indiana, including all of the CZM study area. In 1975 NIPSCO provided 4.4 billion kilowatt hours (KWH) to Lake, Porter and LaPorte Counties. NIPSCO has a total company net demand capacity of 2,545,040 kilowatts. A maximum demand of 1,888,434 kilowatts occurred on July 31, 1975.

Statistics on future needs of the two-county area are not available. NIPSCO anticipates an estimated 6 percent per year average increase for its 30 county service area for the next 5 years. To meet this increasing demand for electricity NIPSCO has two new generating facilities under construction or planned. The Rollin M. Schahfer plant, with an initial net capacity of

487,000 kilowatts is under construction in Jasper County near Kankakee River. Bailly Nuclear One, a 686,000 kilowatt plant is planned for construction in Porter County on Lake Michigan.

Capacity and Needs for Natural Gas Energy

NIPSCO also provides gas for users in Lake, Porter and LaPorte Counties. Usage in these counties for 1975 totaled 164.8 billion cubic feet. NIPSCO's capacity to provide natural gas is limited only by the amount it can purchase from its five pipeline supplies. Due to a national shortage of natural gas, NIPSCO anticipates future supplies to be below present contracts.

Water Supply: Capacity and Needs

The major source of municipal water supply in the CZM study area is Lake Michigan which is in close proximity to most of the region's urban development. The only other surface supply is Flint Lake, which serves the city of Valparaiso. The remaining urban development, principally in the southern portion of the region, is served by groundwater supplies.

Industrial water supply needs are principally for cooling water which is obtained from Lake Michigan by the steel and power generating companies. Process water is obtained directly from Lake Michigan, or from the Grand Calumet River and Indiana Harbor Canal.

Table 8f lists the present municipal and private utility water supply systems and selected properties. As shown by this information, there are 14 public supply facilities and 7 private supply facilities supplying an estimated 77.8 MGD municipal supply to the region. Individual wells serving an estimated 90,000 persons when combined with the 78 MGD above result in a total water usage of about 85 MGD. (Based on an 80 gpcd utilization for the 90,000 persons served by individual wells). Of this total, 71.5 MGD are supplied by Lake Michigan, 1.5 MGD by other surface water, and 12 MGD by collective or individual groundwater supplies.

TABLE 8f :
SELECTED PROPERTIES OF EXISTING WATER SUPPLY AND DISTRIBUTION SYSTEMS

Community or System Name	Est. Pop. Served	Supply Source			Plant Capacity (MGD)	Avg. Pumpage (MGD)	Storage		Type of Treatment	Comments
		Lake Mich.	Other Surf.	Ground Water			Elev. (mg)	Grade (mg)		
<u>Public Systems</u>										
Chesterton - Porter	10,000			X	3.16	0.42	0.40		Ch1	Localized distribution problems
Crown Point	11,000			X	5.0	2.0	0.30		S,I,F1	
Dune Acres	330			X	.143	-	0.04		F1	Distribution Inadequate
Dyer	4,500			X	1.0	0.23	0.35		F1	
East Chicago	52,000	X			24.0	15.0	1.5	5.1	P,F1	Heavy Industrial use
<u>Hammond System:</u>	170,000	X			30.0	26.0	6.5	10.1	P,F1	Expansion to 50 MGD and beyond is proposed
Hammond	107,000						1.5	3.0		
Munster	17,000						0.55	1.75		
Highland	25,000						-	-		
Black Oak Area	1,000									
St. John	1,500			X	0.72	0.10	0.06		Ch1	
Schererville	3,500			X	1.80	0.30	0.25		D	Need additional storage for expansion
Valparaiso	20,000		X	X	3.70 ¹	2.04	1.0		F1,Ph,F	Possible supply problem in future
Whiting	8,500	X			3.6	1.7			P	Heavy industrial use
<u>Private Utility</u>										
Columbian Utilities				City of Valparaiso			None			Critical problems with distribution and overall system management

TABLE 8f :
Continued

Community or System Name	Est. Pop. Served	Supply Source			Plant Capacity (MGD)	Avg. Pumpage (MGD)	Storage		Type of Treatment	Comments
		Lake Mich.	Other Surf.	Ground Water			Elev. (mg)	Grade (mg)		
Gary-Hobart Water Co.:	260,000	X			78.0 ³	30.5	3.25	13.66	P,FI	
Gary East Gary Hobart	183,500 10,000 21,000			x ²			0.50	2.0		
Portage Water Co. Griffith	9,000 18,000						0.30 .335	1.0		
New Chicago Ogden Dunes Merrillville	2,500 1,000						.225			
District Lincoln Gardens Subd. Turkey Creek Util. Capitol Util. Chapel Manor Subd. Bon Air Subd. Brookview Terr. Subd. Black Oak Subd.	6,000									
Ideal Develop. Inc.	8,500			X	3.40	-	0.20		D	
Neighborhood Utilities	-			X	.214	0.03			D	
Rolling Hills	250			X	-	-			Ch1	

TABLE 8f :
Continued

NOTES:

- 1 Limited by 1.5 MGD from Flint Lake and 2.2 MGD production capacity at Airport Station
- 2 Wells are source of base supply which is supplemented by water from the Gary-Hobart Water Company
- 3 54.0 MGD at Gary intake and 24.0 MGD at Ogden Dunes intake

"-" Indicates information not available

no entry - Indicates not applicable

Chl - Chlorination
 Fl - Floridation
 P - Complete filtration including chlorination
 D - Disinfection
 S - Softening
 I - Iron and manganese removal
 ph - pH control

Source: Northwestern Indiana Regional Planning Commission

Capacity and Needs for Wastewater Treatment

Within Lake and Porter Counties, wastewater flow is such that industrial flows far overshadow domestic flows in magnitude. Much of this industrial flow originates from the steel and petroleum industries, and while power generating stations create large volumes of cooling water flows, these are not considered wastewater for the purposes of this discussion. While data pertaining to industrial flows is somewhat sketchy for various reasons, it is estimated that Lake and Porter Counties have 1500-2000 MGD of wastewater flow (not including cooling water); most of this flow is directly to surface streams while a very small portion is estimated to be tributary to municipal treatment plants.

Municipal Wastewater Flow

Selected properties of public and private utility, (non-industrial) wastewater collection-treatment systems are detailed in the chapter on Water Quality. Flow from municipal and private utility (non-industrial) treatment facilities in the region is estimated to be approximately 100 MGD, with about 62 MGD ultimately tributary to Lake Michigan via Burns Ditch or the Indiana Harbor, 36 MGD tributary to the Cal-Sag system in Illinois, and 2 MGD tributary to the Kankakee River. Three sanitary districts, East Chicago, Hammond and Gary, account for 88.5 MGD (or 88.5%) of the regional flow.

Other than the three large sanitary districts mentioned above, other communities with systems above 1 MGD are Valparaiso, Hobart and Crown Point. The remaining public and private systems are less than 1 MGD operations.

Combined sewers (storm and sanitary) are generally the rule in older developed areas; this is true for small towns such as Dyer, Crown Point, Lowell, Valparaiso, and Chesterton-Porter as well as for larger cities such as East Chicago, Gary and Hammond. Separate sewers are found in the more newly developed areas. This predominance of combined sewers throughout the region results in high stormwater runoff pollution discharges during heavy

rain. Corrective action has begun in many areas and such action is sure to continue.

Communications Systems

Five daily newspapers and eight weekly papers serve townships within the CZM study area. Television service is provided mainly through Chicago. Only one UHF television station, WCAE in St. John, originates within the study area. There are seven local AM radio stations, four originating in Lake County and three in Porter County. Table 8g lists the names and location of media originating within the study area.

TABLE 8g : COMMUNICATIONS SYSTEMS

<u>Lake County</u>	<u>Porter County</u>
<u>RADIO STATIONS - AM</u>	
WYCA, Crown Point	WAKE, Valparaiso
WLTH, Gary	WINS, Valparaiso
WWCA, Gary	WNWI, Valparaiso
WJOB, Hammond	
<u>RADIO STATIONS - FM</u>	
WYCA, Hammond	WAKE, Valparaiso
<u>TELEVISION STATIONS - UHF</u>	
WCAE, St. John	NONE
<u>NEWSPAPERS - DAILY</u>	
CROWN POINT REGISTER	CHESTERTON TRIBUNE
POST-TRIBUNE	POST-TRIBUNE
THE TIMES	VIDETTE-MESSENGER
<u>NEWSPAPERS WEEKLY</u>	
CALUMET PRESS	PORTAGE PRESS
EAST CHICAGO GLOBE	
HERALD PAPERS	
HOBART GAZETTE	
INFO	
LAKE COUNTY STAR	
SUN JOURNALS	

Source: NIPSCO, Community Profiles, 1975.

TRANSPORTATION NETWORK

The transportation facilities available within Lake and Porter Counties include a roadway system, passenger and freight railines, airports and harbors. A general description of these facilities is presented in this section along with an origin-destination trip matrix and a summary of major planned improvements in the Region's transportation system.

Transportation Facilities

Roads in an urbanized area such as northwestern Indiana are classified by their primary function. The four functional systems for urbanized areas are urban principal arterials, minor arterial systems, collector streets and local streets. The principal arterial system is further subdivided into 1) interstates; 2) other freeways and expressways, and 3) other principal arterials with no control of access. The interstate system serves the major centers of activity of the metropolitan area, the highest traffic volume corridors, and the longest trip desires. There are approximately 110 miles of expressways in the Region, including interstate highways and other controlled access facilities.

Minor arterial streets provide intracommunity continuity by interconnecting with the principal arterial system and providing service to trips of moderate length. This system also distributes travel to geographic areas smaller than those identified with the higher system.

The collector street systems provides both land access service and traffic circulation within residential neighborhoods and commercial and industrial areas. The collector street also collects traffic from local streets in residential neighborhoods and channels it into the arterial system. There are approximately 1,565 miles of other principal arterials, minor arterials and collector streets in the Region's highway network.

The local street system comprises all facilities not on one of the higher systems. It provides direct access to abutting land and to the higher order systems. Table 9a shows local roads and street miles for municipalities within the CZM study area.

TABLE 9a : TOTAL LOCAL ROADS AND STREET MILES
CZM STUDY AREA

Lake County		Porter County	
Crown Point	51.07	Beverly Shores	39.26
Dyer	26.54	Burns Harbor	10.93
East Chicago	79.32	Chesterton	34.89
East Gary	67.39	Dune Acres	5.79
Gary	428.45	Ogden Dunes	10.78
Griffith	51.52	Portage	84.17
Hammond	268.66	Porter	24.78
Highland	77.47	Pines	10.10
Hobart	87.69	Valparaiso	<u>79.12</u>
Merrillville	116.80	TOTAL	299.82
Munster	66.98		
New Chicago	12.47		
St. John	19.14		
Schererville	29.02		
Whiting	<u>12.99</u>		
TOTAL	1,395.51		

Source: Indiana State Highway Commission

The South Shore and Penn Central are the only passenger railways serving the region. There are sixty actual physical miles of passenger

railways. Freight railways crossing the region include the Baltimore and Ohio, Chesapeake and Ohio, Elgin, Joliet and Eastern, Erie Lackawanna, Grand Trunk Western, Louisville and Nashville, and the Norfolk and Western. Their combined primary trackage total is 5,700 miles.

Table 9b presents a physical description of the region's four public use airports.

TABLE 9b: NORTHWEST INDIANA PUBLIC-USE AIRPORT INVENTORY

Airport Name	Ownership	Length of Primary Runway	Length of Secondary Runway	No. of Paved Runways	Primary Runway Lights	Airport Beacon
Gary Municipal	Public	7000	3600	2	Med. Int.	36"
Griffith	Private	2330	NONE	1	Med. Int.	---
Hobart Sky Ranch	Private	2700	2600	1	----	---
Valparaiso-Porter County Municipal	Public	6000	1800	2	Low Int.	24"

Source: Indiana Airport System Plan

Two additional airports located in the region, Bodin and Wycoff, are private, restricted use airports. The Gary Municipal Airport and the Porter County Airport are both general transport facilities which can accomodate turbo jet aircraft up to 175,000 pounds.

The major water transportation facilities in northwestern Indiana include the Indiana Harbor and Canal, Buffington Harbor, Gary Harbor and the Port of Indiana (Burns Harbor), all of which are on the southern shore of Lake Michigan. All of these facilities except the Port of Indiana are operated by private industries.

The Port of Indiana is a 225-acre harbor which is protected from the open lake by a 4600 foot breakwater, the 5200 foot West Bulkhead and the 3870 foot East Breakhead. Ships are able to enter, berth, and depart in

minimum time with little or no tug assistance. Inland waterway barges operating on the Ohio, Mississippi and Illinois River systems may enter Lake Michigan via the Calumet River for direct transit to the Harbor with virtually year-round access. Approximately 400 acres adjacent to the port are available for leasing to water-oriented industries.

Seven public berths are completed and a new transit shed became operational during the 1972 shipping season. An ultramodern waste treatment plant, capable of processing all types of ship and port wastes was also completed in 1972.

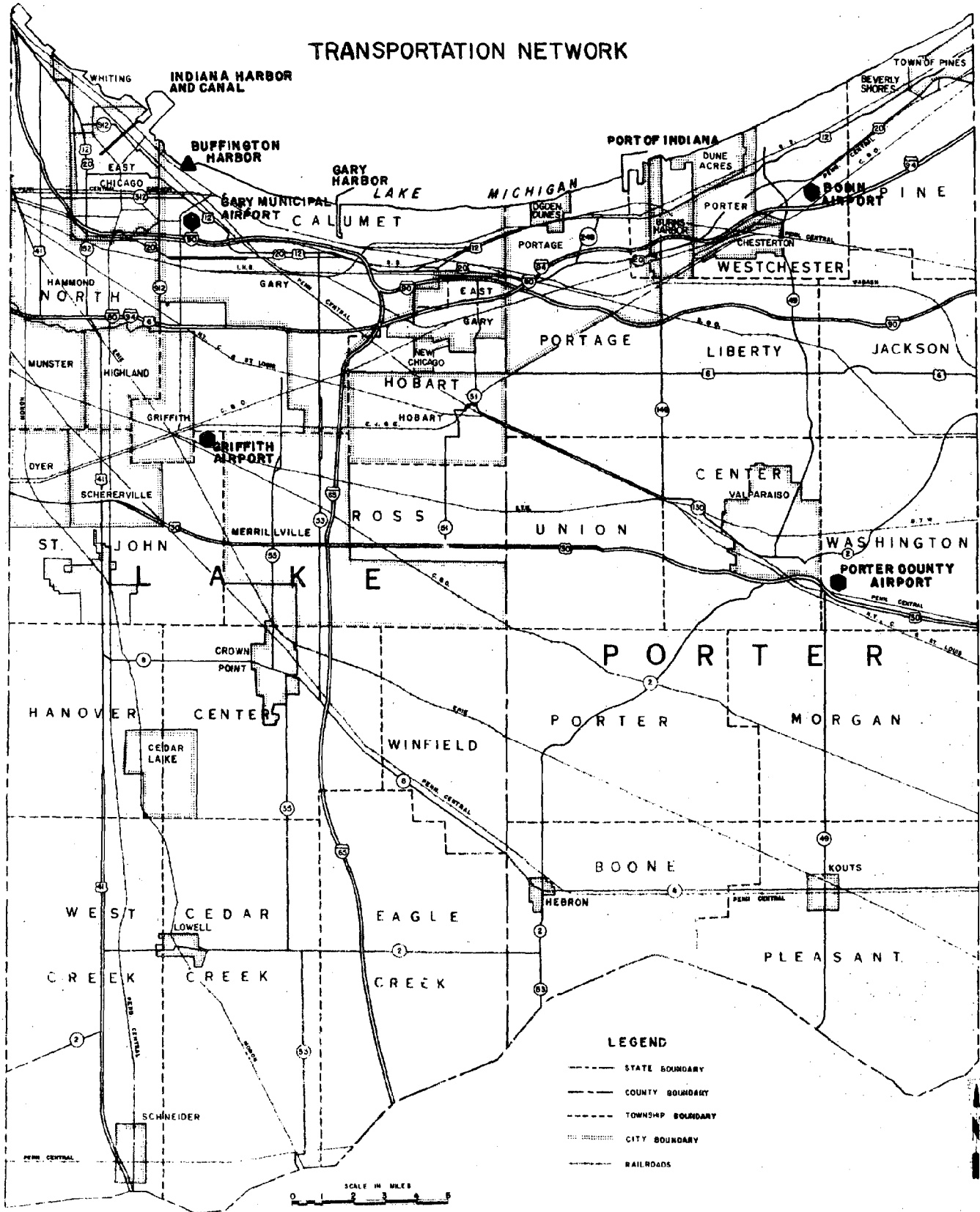
In 1974, over 5.6 million tons of cargo was handled at Burns Waterway Harbor. The largest category of cargo was solid bulk (domestic), which accounted for nearly 5.2 million tons. Other cargos included 204,000 tons of general cargo and 38,000 tons of containerized cargo. Import-export cargo accounted for 310,000 tons, including 207,000 tons of imports and 103,000 tons of exports.

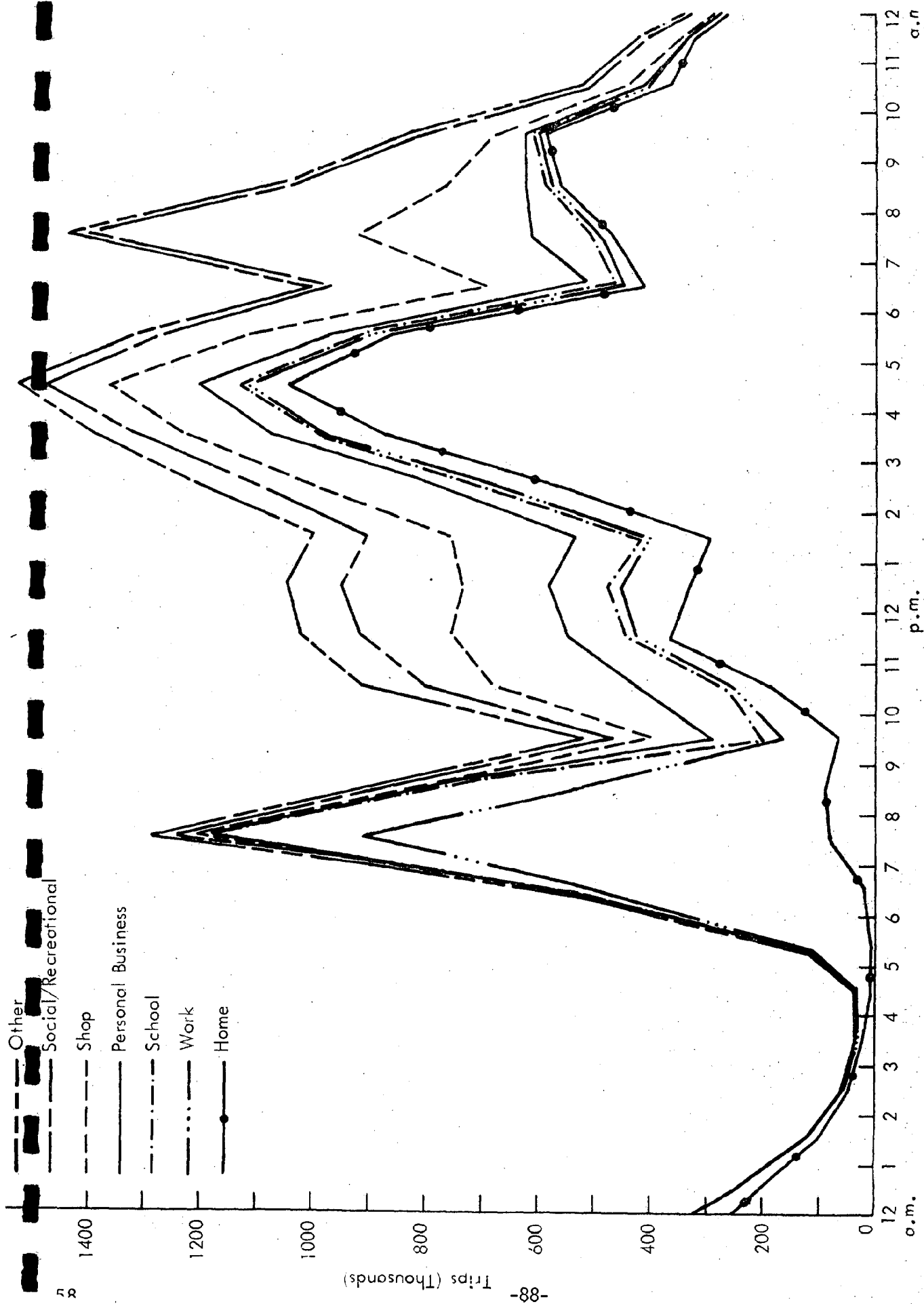
The map on the following page shows the location of the major water, air, rail and highway transportation facilities.

Trip Characteristics

The time distribution of trips within the eight-county northeastern Illinois-northwestern Indiana area by trip purpose is depicted in Figure 3. Although trips to work occur throughout the day, 65.2 percent originate during the period from 6:00 a.m. to 9:00 a.m. Most trips to school also originate during a short period of time, with 72.2 percent starting between 7:00 a.m. and 9:00 a.m. Together, trips to work and to school are the major elements of the morning rush period, constituting 79.5 percent of all trips originating between 7:00 a.m. and 9:00 a.m. Trips to home represent the major constituent of the evening rush period, largely reflecting the flux of trips to home from work, school and shopping.

TRANSPORTATION NETWORK





SOURCE: CATS-NIRPC, 1970 Travel Characteristics
 Figure 2. NUMBER OF TRIP ORIGINS BY TRIP PURPOSE AND TIME OF DAY - 1970 WEEKDAY PERSON TRIPS

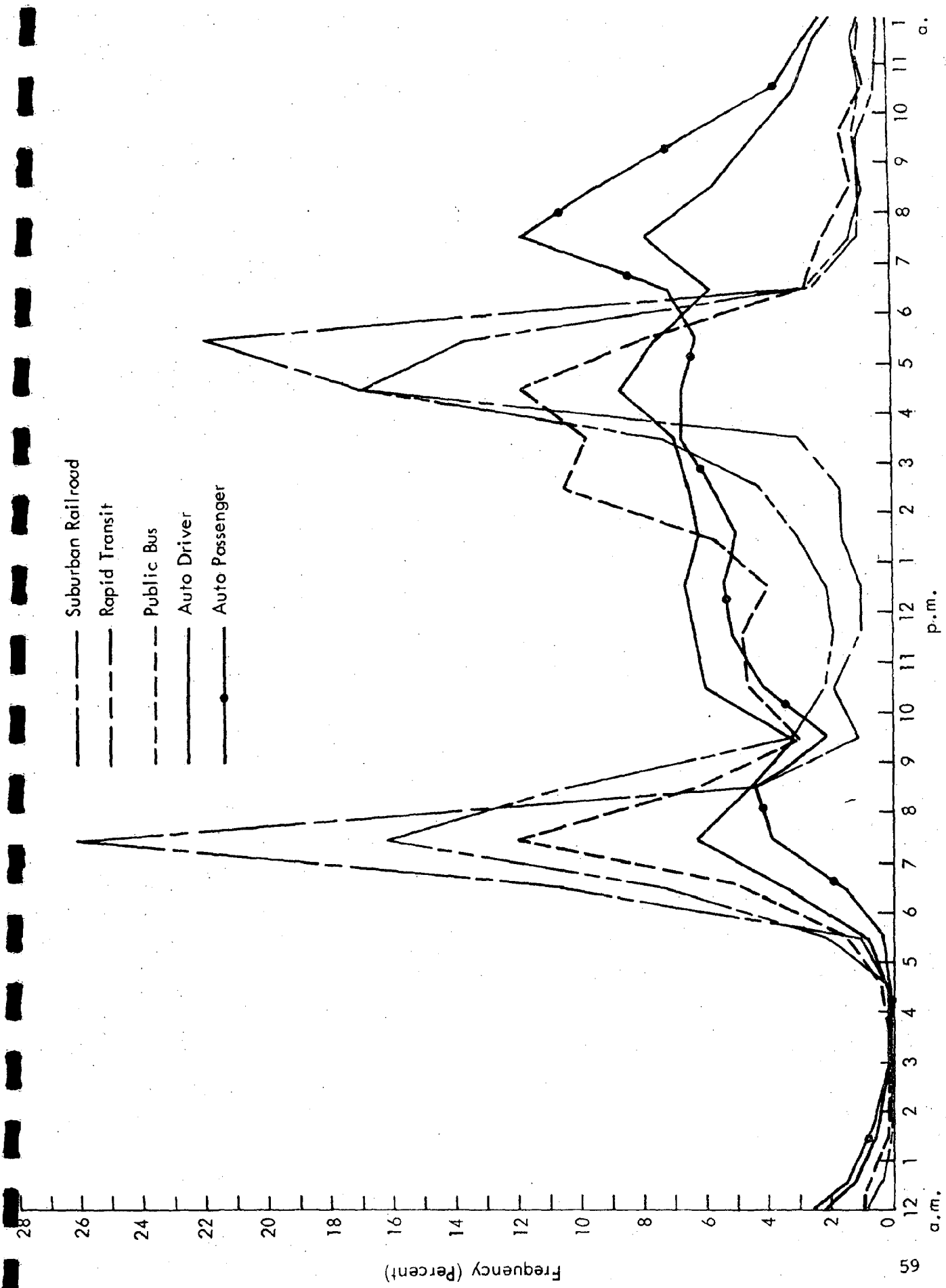
About 35.3 percent of all trips to home start between 3:00 p.m. and 6:00 p.m., accounting for 67.2 percent of all trips beginning during the evening rush period (4:00p.m. to 6:00 p.m.).

Trips to home excluded, non-work trip origins peak between 7:00 p.m. and 8:00 p.m. These non-work trips represent 57.6 percent of the total , trips beginning during the late evening period (7:00 p.m. to 9:00 p.m.). During the earlier parts of the day, non-work trips are distributed rather uniformly compared to trips to work, school and home.

Together, trips for all purposes result in high concentrations of travel during certain periods of the day. The capacity of the transportation system is sized to accomodate these peaks, resulting in an over supply or underulitization of transportation network capacity during other parts of the day.

The peaking characteristic is common to all modes of transportation, but the intensity of the peaks varies by mode. Figure 4 depicts the distribution of trips by starting time and mode of travel. The work orientation of travel on the transit modes is reflected by the high peaks during the morning and evening rush periods on these modes, while the more general purpose usage of the auto is manifested by its less peaked distribution. Auto travel is the least rush-hour oriented, with 24.5 percent of all auto trips starting during the morning and evening peak periods. A significant peak in auto travel, particularly auto passengers, occurs from 7:00 p.m. to 9:00 p.m., with 20.3 percent of all auto passenger trips starting during this period. This corresponds to the late evening shopping and social/recreational travel peak.

Table 9c shows the number of trips originating from townships within the CZM study area. The combined total for Lake and Porter County coastal zone townships, 1,634,932, represents 96 percent of all trips originating in the two-county area. Table 9d gives the figures for destinations from all



SOURCE: CATS-NIRPC, 1970 Travel Characteristics

Figure 6 PERCENT FREQUENCY DISTRIBUTION OF TRIP ORIGINS BY PRIORITY MODE AND TIME OF DAY - 1970 WEEKDAY PERSON T

TABLE 9c : TOTAL TRIP ORIGINS BY TOWNSHIP-
CZM STUDY AREA

Lake County		Porter County	
Calumet	506,866	Center	102,452
Center	70,010	Jackson	2,482
Hobart	96,880	Liberty	9,692
North	566,371	Pine	4,556
Ross	101,234	Portage	82,387
St. John	<u>35,793</u>	Union	5,032
TOTAL	1,377,154	Westchester	<u>51,179</u>
			257,780

Source: NIRPC, Northwestern Indiana Origin-Destination Survey, 1971

TABLE 9d : TOTAL TRIP DESTINATIONS BY TOWNSHIP-
CZM STUDY AREA

Lake County		Porter County	
Calumet	507,635	Center	102,453
Center	70,517	Jackson	2,445
Hobart	96,650	Liberty	9,817
North	565,163	Pine	4,974
Ross	101,422	Portage	82,387
St. John	<u>35,798</u>	Union	5,081
TOTAL	1,275,763	Westchester	<u>51,313</u>
		TOTAL	258,470

Source: NIRPC, Northwestern Indiana Origin-Destination Survey, 1971

origins to study area townships. The study area total represents 90 percent of all destinations to all townships in Lake and Porter Counties. This information was compiled from a survey done as part of the Northwest Indiana Transportation Study. A technical report detailing the methodology of the survey is on file at the Northwestern Indiana Regional Planning Commission.

Major Planned Improvements

On November 27, 1974, the Northwestern Indiana Regional Planning Commission adopted by resolution the Regional 1995 Transportation System Plan. This plan delineates guidelines for future development of highways and public transportation to insure more rational, systematic, and productive decisions in the expenditure of federal, state and local funds.

Highway and public transportation systems form the transportation system plan for northwestern Indiana. This plan, a product of the comprehensive and continuing planning process of the Commission, was developed in coordination with local, state and federal agencies.

Preparation of the regional transportation plan began in 1969 with review and revision of basic data on population, housing, economic and employment activity, land use, vehicle ownership, and travel characteristics. Projections were then made of future socio-economic and travel conditions. Six different transportation alternatives, including the existing network, underwent extensive testing and evaluation to determine the type of system which would best serve anticipated travel demand. A composite plan, the Preliminary 1995 Transportation Plan, resulted from analysis of expressway and transit alternatives, which were then integrated with an arterial highway component. The preliminary plan was based upon design elements which would:

- (1) best serve demand for transportation service anticipated by 1995;
- (2) provide the most beneficial social, economic and environmental influences by satisfying Regional Goals and Objectives; and
- (3) best compliment the Comprehensive Regional Plan.

To ensure a final plan that would be reflective of and responsive to community needs, review of the preliminary plan by technical officials, public officials, and the general public was undertaken. The final product of testing, evaluation, and public review is the Northwestern Indiana Regional 1995 Transportation System Plan.

Transportation planning to meet the growing needs of northwestern Indiana examined the major movements of people and goods in the two-county area. Since the 1995 Transportation Plan is a regional plan, not all types of streets and highways or public transportation are included in it. Only regionally significant roads carrying large volumes of traffic over considerable distances and major routes for bus and rail transportation have been included. This plan consists of two subsystems--a highway system and a transit system. A brief description of these two systems follows.

The highway system was designed to improve the quality of the existing arterial and expressway networks and to recommend new facilities on new right-of-way where future traffic would greatly exceed the capacity of existing roadways. Planned arterials and expressways reflect growth patterns depicted by the Regional Comprehensive Plan. To provide for an adequate level of service throughout the region, the highway network was designed to provide for direct routing, continuous routing and connectivity. Community comprehensive plans were analyzed to provide input to plan design ensuring compatibility of local and regional plans.

There are approximately 930 miles of roadway on the planned highway

network. Of these 930 miles, there are approximately 130 miles of existing expressway, proposed expressway and expressway within study corridors; 70 miles of controlled access highways; and nearly 730 miles of arterial highways.

The transit system provides for commuter rail and express bus service with transportation centers at key locations to optimize intermodal transfers. The transit system seeks to improve and expand the existing transit facilities by utilizing the present commuter rail lines, complemented by a proposed regional bus network. Express buses would operate over this network to link major residential areas with commercial and employment centers. Local bus service, although not part of the regional plan, would provide feeder service to the regional network. Ease of transfer throughout the transit network would provide for convenient travel and improve accessibility to many locations via public transportation. The Northwest Indiana Transportation Authority will assist in coordination of services provided by various carriers and be responsible for operation planning of the transit system.

There are approximately 100 miles of commuter rail lines in the plan for service to be provided between Michigan City and Chicago and Valparaiso and Chicago. Express buses will operate over approximately 175 miles of regional highway.

Improvements to the transportation system in northwest Indiana are planned, designed and implemented by a number of agencies and governmental bodies. The Indiana State Highway Commission has a Capital Improvement Program for Lake and Porter Counties which describes projects to be completed by June 30, 1978. These projects are included in Appendix E. The Northwestern Indiana Regional Planning Commission has prepared extensive improvements in their Fiscal Year 1977 Annual Element for highways, mass transportation and transportation system management. Excerpts from this report are also contained in Appendix E. These short-range programs are designed to be consistent with the above mentioned long-range regional transportation plan.

Since 1957 the State of Indiana has maintained a fixed station monitoring program for the purpose of determining the chemical, physical, bacteriological, and biological characteristics of the State's waters. However, standards for water quality weren't developed until Congress passed the Federal Water Pollution Control Act of 1972. The goals of the Act are to have all navigable waters fishable and swimmable by 1983 and to eliminate the discharge of pollutants into these waters by 1985. Individual states were charged with developing water quality standards following USEPA guidelines that would allow these goals to be met. In Indiana, The State Board of Health determines water quality standards.

The Federal Water Pollution Control Act, under section 208, also provides for area-wide wastewater management programs to meet 1983 water quality goals by planning, managing, and implementing a comprehensive pollution control program for municipal and industrial waste water, residual waste, storm and combined sewer runoff, nonpoint source pollutants, and land use as it relates to water quality. The Northwestern Indiana Regional Planning Commission, in cooperation with the State Board of Health, is responsible for developing a "208" management program for the Grand Calumet, Little Calumet and Kankakee River Basin Drainage Areas. The Grand Calumet and Little Calumet Rivers are part of the Lake Michigan Drainage Basin, which includes all of the CZM Study area.

The initial planning phase in developing the "208" program was recently completed. It included a report containing abstracts of sources of data and information on the three drainage areas and an almost 400-page report documenting water quality in the "208" study area, based on State standards. That report also identifies major sources of pollution and critical areas of

water quality. Included is a brief inventory and description of existing wastewater treatment facilities. A summary of both reports and the findings that relate to the CZM study are included in this chapter. Also included is a brief description of the current status of the "208" program; the goals which have been set and plans to achieve them; and a tentative schedule for completion of the remaining elements of the "208" program.

Sources of Data

Water quality data was collected from four major sources:

- (1) The Indiana State fixed water quality stations
- (2) The STORET Computer program system
- (3) The Indiana State special surveys
- (4) Other relevant publications and studies containing water data for the streams in the study area.

The State's fixed water quality stations in the study area provided the most complete information which can be utilized in a study of this nature. The fixed stations are located primarily at bridges or at waterwork intakes. Because of the limitation of a station's location, one must recognize the fact that some of the locations might not reflect points which would show maximum areas of the effect of certain discharges nor show the extent of improvement that has resulted from past water pollution abatement programs in localized segments of the streams.

There are 15 of the fixed monitoring stations in the coastal zone study area. A list of these stations is shown on Table 10a.

Table 10a

Indiana Fixed Monitoring Stations

<u>Station</u>	<u>Name</u>	<u>Location</u>
BD-0	Burns Ditch at Portage	Midwest Steel catwalk at mouth of Burns Ditch (Robot Monitor Site)
BD-1	Burns Ditch at Portage	Midwest Steel Truck bridge, Portage
BD-2E	Burns Ditch at Portage	State Highway 249 bridge (Crisman Road), Portage
BD-3W	Burns Ditch at Portage	Portage Boat Yard Dock, Portage
GCR-34	Grand Calumet River at Hammond	Hohman Avenue bridge at Hammond
GCR-36	Grand Calumet River at East Chicago	Bridge on Indianapolis Boulevard, East Chicago
GCR-37	Grand Calumet River at East Chicago	Bridge on Kennedy Avenue, East Chicago
GCR-41	Grand Calumet River at Gary	Bridge on U.S. Highway 12, Gary
IHC-0	Indiana Harbor Canal at East Chicago	Downstream from Youngstown Steel, mouth of ship canal
IHC-1	Indiana Harbor Canal at East Chicago	Bridge on Dickey Road, East Chicago
IHC-3S	Indiana Harbor Canal at East Chicago	Bridge on Columbus Drive, East Chicago
IHC-3W	Indiana Harbor Canal at East Chicago	Bridge on Indianapolis Boulevard, East Chicago
LCR-13	Little Calumet River at Hammond	Hohman Avenue bridge, Hammond
LCR-39	Little Calumet River at Porter	State Highway 149 south of U.S. Highway 12, Porter
SLC-12	Salt Creek near Valparaiso	State Highway 130 bridge, below Valparaiso sewage treatment plant

Source: Northwestern Indiana Regional Planning Commission, 208 Areawide Wastewater Treatment Management Planning Program

Table 10b gives a sample of the type of data available from the fixed station monitoring program.

Another aspect of the State's water quality control program that yields a different type of information is the N.P.D.E.S. permit. The National Pollutant Discharge Elimination System is a nation-wide permitting system authorized under section 402 of the Federal Water Pollution Control Act. Administered by the Indiana Stream Pollution Control Board under the State Board of Health, this program requires all major sources of pollution to have operating permits for each outfall the source maintains. N.P.D.E.S. permit holders are also required to file monthly operating reports detailing the amount of wastewater dumped into area waterways (waste loads) and its characteristics (parameters). This system makes it possible to identify major problem sources of pollution and to enforce assigned restrictions on the quantities, rates and concentrations of specific parameters (effluent limitations). Table 10c gives a sample of the type of data collected from the N.P.D.E.S. permit holders' operating reports for a few of the industries located in the coastal zone.

The STORET program contains a computerized summary of water quality from the different state and federal stations. From this data, only general trends in water quality and the influences of large pollution sources are apparent.

The State's special surveys provide data on water quality in areas where data from fixed stations is incomplete. Special surveys and reports from other sources serve a similar function.

TABLE 10b:
Little Calumet River (West Branch)
Water Quality Data 1973

<u>Location</u>	<u>Distance From Mouth in Miles</u>	<u>Avg.</u>	<u>Min. (mg/l)</u>	<u>Max.</u>	<u>Number of Samples</u>
<u>A. BOD₅</u>					
BD-0	0	3.2	1.2	4.6	19
BD-1	0.7	3.3	1.2	7.7	19
BD-3W	1.8	5.3	1.2	12.0	19
LCR-13	23.6	9.3	3.3	15.0	19
<u>B. DO</u>					
BD-0	0	8.0	5.7	11.0	18
BD-1	0.7	8.2	5.9	10.9	18
BD-3W	1.8	9.2	5.4	18.3	18
LCR-13	23.6	5.1	0.5	9.8	19
<u>A. Suspended Solids</u>					
BD-0	0.0	24	9	53	19
BD-1	0.7	28	8	81	19
BD-3W	1.8	28	6	55	19
LCR-13	23.6	45	13	280	19
<u>B. Phosphorous (P)</u>					
BD-0	0.0	0.17	0.03	0.36	18
BD-1	0.7	0.17	0.09	0.24	19
BD-3W	1.8	0.41	0.26	0.62	19
LCR-13	23.6	1.17	0.35	3.55	19

TABLE 10b Cont :
 Little Calumet River (West Branch)
 Water Quality Data 1973

Fecal Coliform

<u>Location</u>	<u>Distance From Mouth in Miles</u>	<u>Avg.</u>	<u>Min.</u>	<u>Max.</u>	<u>Number of Samples</u>
			(mg/l)		
BD-0	0.0	1,373	140	6,800	19
BD-1	0.7	1,623	90	8,800	19
BD-3W	1.8	1,890	10	7,800	19
LCR-13	23.6	57,337	510	620,000	19

A. Nitrates (NO₃-N)

BD-0	0.0	1.1	0.6	1.6	19
BD-1	0.7	1.1	0.6	1.7	19
BD-3W	1.8	2.0	0.5	3.0	19
LCR-13	23.6	1.1	0.1	5.0	19

B. Ammonia (NH₃-N)

BD-0	0.0	0.49	0.30	0.80	19
BD-1	0.7	0.69	0.30	1.20	19
BD-3W	1.8	0.79	0.20	1.50	19
LCR-13	23.6	3.04	0.40	7.20	19

Source: Northwestern Indiana Regional Planning Commission, 208 Areawide
 Wastewater Treatment Management Planning Program

TABLE 10c:

EFFLUENT CONCENTRATIONS AND LOADS FROM INDUSTRIES IN CALUMET AREA

DRAINING INTO LAKE MICHIGAN DIRECTLY

OR VIA LITTLE CALUMET RIVER AND BURNS DITCH

Average values (maximum values in parenthesis)

Source: NPDES data compiled by Citizens for a Better Environment
as of December 1973

Source and outfall	mgd	Flow m ³ /sec	Chloride		Ammonia-Nitrogen		Total organic carbon		Fluoride	
			mg/L	lb/day	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day
NIPSCO Bally 001	Cooling 456	20.	8 (8)	30,448 (31,220)	- (0.03)	- (117)	- -	- -	- -	- -
Bethlehem Steel 001	treated process 104	4.6	30 (140)	25,821 (139,864)	0.1 (1.4)	86 (1,998)	- -	- -	0.43 (1.42)	370 (2,027)
002	154	6.7	8 16	10,219 (21,665)	0.1 (1.4)	127 (2,070)	- -	- -	0.13 1.0	166 (1,479)
Midwest Steel 001	0.023	0.001	- -	- -	0.5 (0.65)	<1 (0.271)	- -	- -	- -	- -
002/003	Cooling 4.76	0.2	- -	- -	- -	- -	- -	- -	- -	- -
004	9.06	0.40	20 (25)	1,512 (2,168)	0.0185 (0.035)	1.4 (2.64)	- -	- -	1.00 (3.0)	76 (260)
005	Cooling 1.08	0.047	- -	- -	- -	- -	- -	- -	- -	- -
006/STP	0.0001	-	- -	- -	- -	- -	- -	- -	- -	- -
U.S. Steel Gary 035	76.8	3.36	12	7,686	0.3	132	-	-	0.2	128
036	28.2	1.24	11	2,587	-	-	-	-	0.2	47
037	7.0	0.307	11	642	0.2	12	-	-	-	-
038	10	0.44	Recently became operational; no data available							
039	71.3	3.12	12	7,136	0.3	178	-	-	-	-
Marblehead Lime 007	0.07	0.003	-	-	0.05	small	-	-	-	-
008	0.06	0.003	-	-	-	-	-	-	-	-

TABLE 10c Cont:

Source and outfall	Total iron		Total solids		Total suspended solids		Total phosphorus		Total coli	
	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day
NIPSCO Bailly										
001	-	-	182 (165)	692,692 (643,919)	20 (3)	76,120 (11,708)	(0.27)	(1,054)	642 (642)	24.2x10 ⁶
Bethlehem Steel										
001	2.358 (9.6)	2,030 (13,705)	286 (430)	246,163 (656,696)	16 (74)	13,771 (105,642)	0.37 (3.0)	318 (4,282)	-	-
002	1.339 7.0	1,710 (10,353)	214 (300)	273,357 (443,718)	16 (209)	20,437 (309,123)	0.21 (2.0)	259 (2,958)	-	-
Midwest Steel										
001	-	-	170 (170)	32 (71)	(3)	(11,708)	0.15 (0.15)	<1 (0.063)	-	-
002/003	-	-	-	-	-	-	-	-	-	-
004	0.5 (0.7)	38 (60.67)	957 (823)	72,350 (62,233)	10.7 (11.0)	809 (833)	0.1 (0.1)	8 (7.55)	-	-
005	-	-	-	-	-	-	-	-	-	-
006/STP	-	-	-	-	7.7	small	-	-	-	-
U.S. Steel Gary										
035	-	-	155	99,020	3	1,192	0.42	12.8	-	-
036	0.1	9	168	39,512	10	2,352	0.02	4.7	-	-
037	1.1	64	165	9,633	6	350	0.02	1.2	-	-
038	-	-	-	-	-	-	-	-	-	-
039	1.8	64	226	134,399	21	12,487	0.01	6.4	-	-
Marblehead Lime										
007	-	-	952	556	0	0	0.6	small	-	-
008	-	-	987	494	0	0	-	-	-	-

Water Quality Standards

The State Board of Health determines the allowable stream concentration regulations pertaining to wastewater constituents, or parameters. Six major parameters form the water quality data base: dissolved oxygen, biochemical oxygen demand, nitrogen, phosphorus, suspended solids, and fecal coliforms. The list on the following page defines these and additional terms necessary to understand water quality data.

The Indiana Stream Pollution Control Board, under the Indiana State Board of Health, is the agency designated by the Indiana Environmental Management Act of 1971 to implement and review the water quality standards. Present standards that have impact on the water quality in the study area are: Regulation SPC-1R-3, "Water Quality Standards for Waters of Indiana"; Regulation SPC-4R, "Minimum Conditions Applicable to Waters of Lake Michigan and Harbor Areas"; Regulation SPC-7R-2, "Water Quality Standards for the Grand Calumet River and the Indiana Harbor Ship Canal"; Regulation SPC-10R, "Water Quality Standards for Wolf Lake; and Regulation SPC-12, "Natural Spawning Areas, Rearing or Imprinting Areas and Migration Route of Salmonid Fishes". Appendix F contains these regulations.

After water quality standards that will meet the 1983 goals are developed, waste load allocations for stream segments are determined. A waste load allocation for a segment is the assignment of target loads to point and nonpoint sources of pollution so as to achieve water quality standards in the most effective manner. Appendix G contains sample data compiled from the NPDES operator's reports from the Inland Steel outfalls showing the allocated loads for each parameter and the actual amount the discharge contained.

Alkalinity	The ability of natural waters to neutralize acids. Represents the ratio of carbonate - bicarbonate ions present. It is expressed in parts per million of calcium carbonate.
Bacteria	Primitive plants, generally free of pigment, that reproduce by simple division or spore formation. They occur as single cells, as colonies, as filaments, and do not require light for their life processes. They depend upon living or dead organic material as a media for growth.
BOD	Biological Oxygen Demand (units mg/l) An index used to indicate the relative amount of living and non-living organic demand for oxygen imposed by wastes of various kinds. The 5-day BOD is often used to evaluate the amount of organic input into a stream.
Coliform	A large and varied group of bacteria occurring in animal guts, man, and also found on vegetation. Coliform bacteria, by definition are aerobic or facultative anaerobic gram negative, non-sporeforming, rod shaped bacilli that ferment lactose with gas formation. Two dominant species of this group are <u>Escherichia Coli</u> and <u>Aerobacter Aerogenes</u> .
D.O.	Dissolved Oxygen (units mg/l) A direct measurement of the amount of oxygen actually dissolved in the water. Dissolved Oxygen concentration is directly related to atmospheric pressure and inversely related to temperature. A high dissolved oxygen content is important for a balanced aquatic community.
Effluent Limitation	Any restriction established by a State or the Administrator on quantities, rates, and concentrations of chemical, physical, biological or other constituents which are discharged from point sources into navigable waters.

Fecal Coliform

A part of a large and varied group of bacteria. The fecal coliform bacteria flourish in the gut and feces of warm blooded animals, including man. This measurement is used as an indication of the amount of sanitary sewage or feed-lot that may be entering a stream. It is also used as an indicator as to the presence or absence of pathogenic bacteria. The presence of high fecal coliform counts suggests that streptococci and viruses may be present.

Heavy Metals

Also called trace metals. Many heavy metals are quite toxic. However, other metals, at low levels are considered beneficial to human health. Some heavy metals, particularly manganese, iron, zinc, vanadium, molybdenum, cobalt, and copper, are essential micronutrients for algae. Copper is essential for algal growth at a level of 30-40 ppb, but is toxic at levels above 400ppm. This is true for many of the metals. Other metals in this class include: Cadmium, Chromium, Iron, Lead, Manganese, Mercury, Silver, and Zinc.

Nitrate

The chemical symbol is NO_3 . Nitrate is also a macronutrient. Nitrogen is required for the production of protein in living systems. Nitrates often are the limiting factor in aquatic algal growth. Thus, artificially increasing the nitrate level of a stream or lake can upset the ecological balance. Nitrates are measured as total nitrogen.

Non-point source

Generalized discharge of waste into a waterbody which cannot be located as to specific source.

Nutrient

Any substance assimilated by organisms which promotes growth and replacement of cellular constituents.

pH	This is the negative logarithm of the hydronium ion concentration of a solution. It is measured on a scale of one to fourteen. A low pH value indicates an acid solution, a high value, a basic solution. Natural waters generally range in pH from 6 to 9 units.
Point source	Any discernable, confined, and discrete conveyance including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft from which pollutants are or can be discharged.
Phosphates	The chemical symbol is PO_4 . Phosphate is in a group of chemicals known as macronutrients. Phosphorus is a necessity of life, but when present in too high a concentration it can cause nuisance algal blooms.
Suspended Solids	Measured in mg/l. Is a measurement of the amount of material that is held in suspension by the physical properties of water. Generally flowing water will be able to support a higher suspended load.
Turbidity	The capacity of materials suspended in water to scatter light. It is measured in arbitrary Jackson Turbidity Units (JTU). This measurement is used to indicate the amount of suspended material in the water.
Temperature	Degree of hotness or coldness as indicated by a thermometer.
Toxic Substance	A poisonous chemical that may cause harm to various plant or animal life. When looking at toxic substances, synergistic, antagonistic and sublethal effects must be considered.

Major Sources Of Pollution

Sources of pollution are divided into point and nonpoint sources. Briefly, point sources are those to which pollution can be directly traced and nonpoint sources are those which pollute, but not from any identifiable, specific location.

Industrial, municipal and semi-public wastewater treatment plants are the major point sources of pollution. Tables 10d and 10e identify these sources in northwestern Indiana.

Three general areas of non-point sources of pollution have been identified in the Region. These are stormwater runoff, agricultural runoff and atmospheric "scrubbing" by rainstorms.

Stormwater runoff is the result of rain or melting snow running off impervious areas (parking lots, streets) and picking up debris and filth as it finds its way into streams within the area. According to studies undertaken by the USEPA, there is some evidence to suggest that this problem may contribute as much pollution as some point sources. Studies indicate that the "first flush" of stormwater runoff is as equally offensive as raw domestic discharges.

General agricultural activities and animal feedlots are the sources of agricultural runoff. This primarily affects southern Lake and Porter Counties and the Kankakee River Basin. Pollution results from erosion of the land, allowing nutrients, herbicides and pesticides to wash into area streams.

A newly defined area of nonpoint source pollution that must be considered in this area is that which is contributed by precipitation. Atmospheric "scrubbing" by rainstorms adds significantly to the pollution of lakes and streams. Despite indications that the area's air quality is improving, this

TABLE 10d : MAJOR SEMI-PUBLIC POLLUTION
SOURCES IN THE CZM STUDY AREA

Source	Location
Apple Valley Estates M.H.P.	Lake County
Brookview Terrace Subdivision	Lake County
Center Utilities, Inc.	Lake County
Christian Assembly Church	Lake County
Insbroom Bon Air Subdivision	Lake County
Hyles-Anderson College	Lake County
John Wood Elementary School	Lake County
Lake Dale Fairways	Lake County
Lake George Plateau Subdivision	Lake County
Lakes of the Four Seasons	Lake County
Lake Region Christian Assembly Church Camp	Lake County
Lincoln Gardens Subdivision	Lake County
Melody Lane Trailer Park	Lake County
Nob Hill Subdivision	Lake County
Oak Tree M.H.P.	Lake County
River Forrest Schools	Lake County
Rolling Hills Subdivision	Lake County
Utilities, Inc.	Lake County
Brummit Elementary School	Porter County
Burns Harbor Estates	Porter County
Elmwood M.H.P.	Porter County
Lake Louis Development	Porter County
Liberty Elementary & High School	Porter County
Liberty Farm M.H.P.	Porter County
Pleasant Valley M.H.P.	Porter County
Sands M.H.P.	Porter County
South Haven Subdivision	Porter County
Williamsburg Manor M.H.P.	Porter County

Source: Sanitary Department, Indiana Stream Pollution Control Board

MAJOR MUNICIPAL POLLUTION SOURCES

Name and Location	Notes
Chesterton S.T.P.	
Crown Point	
Dyer	
East Chicago	
East Gary	
Gary	Storm & Combined Sewer Discharges Only
Griffith	
Hammond	
Hebron	
Highland	
Hobart	Storm & Combined Sewer Discharges Only
Lowell	
Schererville	
Schneider	
Valparaiso	
Kouts	
Portage	

Source: NPDES permits U.S.E.P.A., Indiana Stream Pollution Control Board

TABLE 10e: MAJOR INDUSTRIAL POLLUTION SOURCES

Name	Location	Notes ¹
Bethlehem Steel	Chesterton	3 permits
NIPSCO (Bailly Station)	Chesterton	
Culligan Soft Water Service	Crown Point	
American Steel Foundaries	East Chicago	2 permits
C.F. Petroleum	East Chicago	
Blaw Knox Foundry Mills	East Chicago	2 permits
Cities Service Oil Co.	East Chicago	2 permits
E.I. Dupont de Nemours & Co.	East Chicago	3 permits
General American Transportation Corp.	East Chicago	13 permits
Inland Steel Co.	East Chicago	
Phillips Petroleum Co.	East Chicago	
Union Carbide	East Chicago	
U.S.S. Lead Refining, Inc.	East Chicago	
Youngstown	East Chicago	11 permits
Cris Craft Indiana	Gary	
Kaiser Aluminum	Gary	
Marblehead Lime Co.	Gary	2 permits
NIPSCO	Gary	2 permits
Union Carbide Linde Division	Gary	
U.S. Steel	Gary	23 permits
Universal Atlas	Hammond	
American Maize	Hammond	5 permits
American Maize Water Treatment	Hammond	
Commonwealth Edison	Hammond	
Harbison Walker	Hammond	
Lever Brothers	Hammond	
Louisville & Nashville R.R.	Hammond	
National Steel Co.	Portage	6 permits
American Brick	Munster	
Simmons Co.	Munster	
Amoco	Whiting	2 permits
Union Carbide	Whiting	2 permits
Coca-Cola	Valparaiso	

Source: NPDES permits of U.S.E.P.A., Indiana Stream Pollution Control Board

1. Numbers refer to number of NPDES operating permits

factor still remains influential.

Existing Wastewater Treatment Facilities

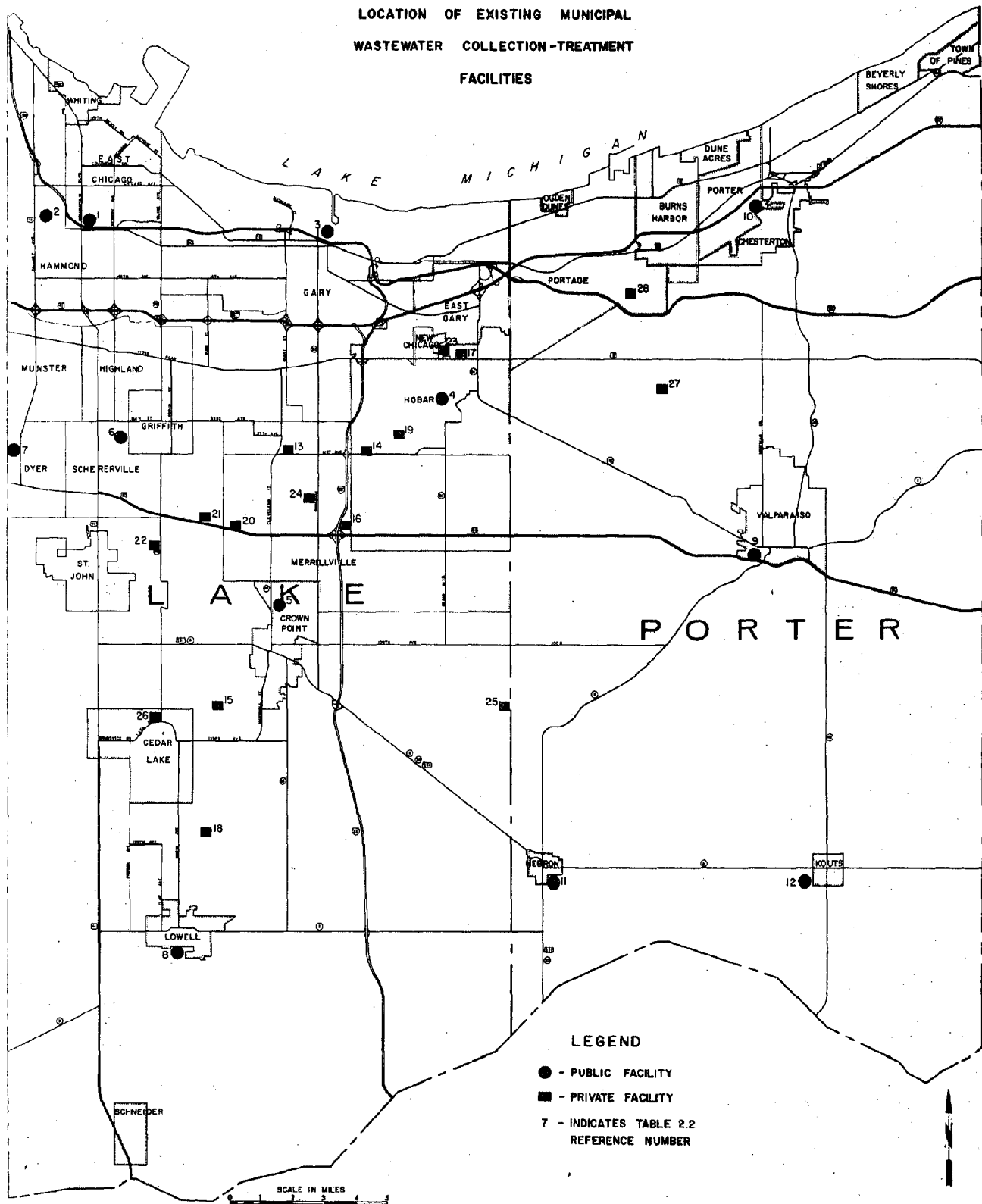
The map on the following page shows the existing municipal and semi-public wastewater treatment facilities. The reference numbers on this map can be used to identify the name, service area and characteristics of each facility, by referring to Table 10f. This table includes information on the capacity and flows for each facility, as well as the type of sewers and treatment and the population served. This information is being updated as part of the "208" program. During the development of the actual management plan, priority ratings for new or expanded facilities will be determined.

Industrial flows over 5 MGD are summarized in Table 10g in terms of: name of industrial firm, nature of flow, magnitude of flow, and flow characteristics. Essentially, the power generation facilities generate large amounts of cooling water while the petroleum and steel industries generate the largest amounts of process wastewater. Current trends toward recycling of process wastewater, if continued, will reduce the overall industrial wastewater load.

A Summary Of The Region's Water Quality

From the water quality data studied, it can be stated that of all the streams in the study area, the Grand Calumet River and the Indiana Harbor Canal have shown the most violations of the standards in many of the quality parameters. These two channels carry the effluent from the major steel mills, refineries, and municipal wastewater treatment plants and discharge these waters into Lake Michigan. While the water quality

LOCATION OF EXISTING MUNICIPAL
WASTEWATER COLLECTION-TREATMENT
FACILITIES



ON NORTHWESTERN INDIANA
REGIONAL PLANNING
COMMISSION

TABLE 10f.
SELECTED PROPERTIES OF WASTEWATER COLLECTION - TREATMENT SYSTEMS

Fig. 2.2 Ref. No.	System Name	Population Served	Receiving Waterway or System	Design Capacity (MGD)	Avg. Dry Weather Flow (MGD)	Type of ¹ Treatment	Type of ² Sewers	Comment
1	<u>Public Systems</u> East Chicago S.D.	52,100	Grand Calumet ³	20.0	12.5	AS	C,S	large labor force & industrial usage
2	Hammond S.D.: Hammond Munster Highland Griffith Whiting	174,600 107,100 16,500 25,000 18,000 8,000	Grand Calumet ⁴	55.0	36.0	AS	C,S S,C C,S C,S C	contract customer of S.D. contract customer of S.D. contract customer of S.D.
3	Gary S.D.: Gary East Gary Merrillville Indep. Hill Cons. Dist.	201,000 183,000 10,000	Grand Calumet ³	75.0	40.0	AS	C,S	Indep. Hill has no sewers at present
4	Hobart	21,000	Deep River ³	2.2	1.7	AS	S	
5	Crown Point	11,000	Beaver Dam ³ Creek	1.8	1.2	AS	C,S	
6	Schererville	3,500	Hart Ditch ⁴	0.35	0.30	AS	S	
7	Dyer	4,500	Hart Ditch ⁴	0.60	0.30	AS	C,S	

TABLE 10f Cont:
Continued

Fig. 2.2 Ref. No.	System Name	Population Served	Receiving Waterway or System	Design Capacity (MGD)	Avg. Dry Weather Flow (MGD)	Type of ¹ Treatment	Type of ² Sewers	Comment
8	Lowell	3,200	Cedar Creek ⁵	0.55	0.25	TF	C,S	considerable operating problem
9	Valparaiso	20,000	Salt Creek ³	2.25	2.85	AS	C,S	anticipated expansion
10	Chesterton-Porter	10,000	Little Calumet ³	1.50	0.90	AS	C	
11	Hebron	1,500	Cobb Creek ⁵	0.33	-	TF	S	system under construction
12	Kouts	1,500	Pleasant Twp. ⁵ Ditch	0.24	-	AS	S	
13	<u>Private Systems</u> Bon Air Subd.	-	Turkey Creek ³	0.36	-	AS	S	
14	Brookview Terrace Subd.	-	Turkey Creek ³	0.10	-	AS	S	some flow to Mer C.D. operational problems
15	Center Utilities	700	Foss Ditch ⁵	0.88	0.006	AS	S	
16	Chapel Manor Subd.	-	Merrillville C.D.				S	
17	Knob Hill Subd.	-	Deep River ³	0.10	-	AS	S	operating problem
18	Lake Dalecarlia	50	Cedar Creek ⁵	0.10	-	AS	-	
19	Lake George Subd.	-	Deep River ³	0.10	-	AS	S	operating problem

TABLE 10f Cont.
Continued

Fig. 2.2 Ref. No.	System Name	Population Served	Receiving Waterway or System	Design Capacity (MGD)	Avg. Dry Weather Flow (MGD)	Type of ¹ Treatment	Type of ² Sewers	Comment
20	Lincoln Gardens	-	Turkey Creek ³	0.20	0.16	AS	S	operating probl
21	Rolling Hills Est. Subd.	250	Turkey Creek ³	0.035	-	AS	S	
22	Schererville Heights	-	Turkey Creek ³	0.06	0.05	AS	S	plant presently overloaded
23	Triple A Util.	-	Deep River ³	0.05	-	AS	S	operating diffi- culties
24	Turkey Creek Util.	-	Merrillville C.D.				S	
25	Utilities Inc.	200	Stoney Run ⁵	0.19	-	AS	S	newly constructe
26	Utopia Subd.	-	Cedar Lake ⁵	0.10	-	AS	S	to be integrated with Cedar Lake system when com- pleted
27	Ideal Dev. Inc.	8,500	Salt Creek ³	0.70	-	AS	S	presently being enlarged to 2.0MG with phosphorus removal and dual medic filtering.
28	Neighborhood Util.	-	Salt Creek ³	0.10	-	AS	S	

Source: Northwestern Indiana Regional Planning Commission

Notes:

- 1 AS - Activated Sludge
TF - Trickling Filter
- 2 C - Combined; S - Separate; order of listing indicates predominance
- 3 flow ultimately to Lake Michigan under normal conditions
- 4 flow ultimately to Illinois under normal conditions
- 5 flow ultimately to Kankakee River
- "_" indicates information not available
no entry - indicates not applicable

TABLE 409
MAJOR INDUSTRIAL WASTE TREATMENT FACILITIES¹

COMPANY NAME	LOCATION	WASTEWATER FLOW (MGD)	INDUSTRIAL PROCESS			TYPE OF INDUSTRY	CHARACTER OF WASTEWATER	HEAT (°F)		FECAL COLIFORM MPN/100 ml	TOTAL DISSOLVED LIQUIDS	BOD
			Cooling	Processes	Sanitary			WINTER	SUMMER			
Union Carbide Corp. Linde Division Gary, Indiana	Lake Michigan	100	X			Chemical	Thermal	40/ 50	65/ 82		160.1/ 161.8	1.67/ 1.67
U.S. Steel Gary, Indiana	Lake Michigan	78.3		X		Steel	Solids, Nitrogen Oils, T.M.	NA	67/ 72	BL	106.3/ 131.2	.55/ .45
		76.8	X			Steel	COD	NA	72/ 75	BL	100/ 98	5.12/ .448
		28.2	X	X		Steel	Solids, BOD	NA	67/ 84	BL	38.3/ 37.15	.2/ .66
Northern Indiana Public Service Co. Chesterton, Ind.	Lake Michigan	456	X			Power	Thermal	45/ 57	68/ 83	BL	585.7/ 585.7	9.125/ 9.125
Subtotal		2164.65										

TABLE 29g. Cont.
MAJOR INDUSTRIAL WASTE TREATMENT FACILITIES¹

COMPANY NAME	LOCATION	WASTEWATER FLOW (MGD)	INDUSTRIAL PROCESS			TYPE OF INDUSTRY	CHARACTER OF WASTEWATER	HEAT (°F)		FECAL COLIFORM MPN/100 ml I/D	TOTAL DISSOLVED LIQUIDS I/D		BOD I/D
			Cooling	Process	Sanitary			WINTER I/D	SUMMER I/D				
Youngstown Sheet & Tube Company East Chicago, Ind.	Indiana Harbor Ship Canal to Lake Michigan	65.44	X			Steel	Solids	50/ 75	70/ 84	BL	95.5/ 109.1		8/ 1.843
		79.19	X	X		Steel	Solids, BOD, Oils, Color	50/ 68	70/ 79	BL	115.6/ 172.8		2.18/ 2.47
		121.57		X		Steel	Solids, Oils, Toxic Substance, T.M.	50/ 56	70/ 79	BL	177.5/ 287		3.345/ 1.62
Subtotal		1767.02											
Little Calumet Sub-Drainage Basin													
Bethlehem Steel Burns Harbor	Little Calumet to Burns Ditch	116		X		Steel	Solids, BOD, Oils, Phenols	32/ 41	69/ 74	BL	17.9/ 24.7		.965/ 1.935
		147	X			Steel	TDS, COD	32/ 40	69/ 74	NA	226.8/ 243		1.23/ 1.23
National Steel Corp. Portage, Indiana	Burns Ditch to Lake Michigan	4.98	X			Steel		35/ 48	65/ 74	213/ 213	9.75/ 9.75		.043/ .043
		9.06	X	X		Steel	Thermal, TDS, BOD	35/ 70	65/ 86	70/ 28	6/ 59.1		.077/ .235

TABLE 10g Cont.
MAJOR INDUSTRIAL WASTE TREATMENT FACILITIES¹

COMPANY NAME	LOCATION	WASTEWATER FLOW (MGD)	INDUSTRIAL PROCESS			TYPE OF INDUSTRY	CHARACTER OF WASTEWATER	HEAT (°F)		FECAL COLIFORM MPN/100 ml	TOTAL DISSOLVED LIQUIDS	BOD
			Cooling	Process	Sanitary			WINTER I/D	SUMMER I/D			
Grand Calumet Sub-Drainage Basin												
U.S. Steel Gary, Indiana	Grand Calumet	419.47	X	X	X	Steel	Solids, BOD, Oils, Nitrogen, Iron	NA	67/76	BL	569.6/1.180	2.935/22.7
Cities Service Oil Co., East Chicago	Grand Calumet to Indiana Harbor Ship Canal	66	X	X		Petroleum	Thermal, TDS, BOD, Oils	35/60	68/90	BL	84.2/89.5	55/6
Atlantic Richfield Co., East Chicago	Indiana Harbor Ship Canal	4.75	X			Petroleum	Color, Thermal, Solids, COD, Nitrogen, Oils	45/98	75/105	BL	10.7/37.65	4/.4
Inland Steel Co. East Chicago	Indiana Harbor Ship Canal	330	X			Steel	Thermal, T.M., Solids, COD, Toxic Substance	36/7	68/81	BL	459.5/479.4	8.25/5.325
		564.75		X		Steel	Color, Thermal, Solids, BOD, Oils, Phenols, Toxic Substance, T.M.	34/46	68/80	BL	786.6/803.9	4.13/25.17
		115.85	X		X	Steel	Thermal, Solids, Nitrogen, Oils, Phenols, Toxic Substance	34/54	68/38	BL	161.35/219.05	2.9/1.935

TABLE 10g Cont.
MAJOR INDUSTRIAL WASTE TREATMENT FACILITIES¹

COMPANY NAME	LOCATION	WASTEWATER FLOW (MGD)	INDUSTRIAL PROCESS			TYPE OF INDUSTRY	CHARACTER OF WASTEWATER	HEAT (OF)		FECAL COLIFORM MPN/100 ml	TOTAL DISSOLVED LIQUIDS	BOD
			Cooling	Process	Sanitary			WINTER	SUMMER			
								I/D	I/D	I/D	I/D	I/D
Subtotal		277.04										
Drainage into Wolf Lake Lever Bros. Co. Hammond, Indiana	Wolf Lake	5.15	X	X		Soap & Detergent	BOD, Oils	35/55	70/79	BL	7.56/7.6	.043/.6

¹ Includes those facilities having an average flow of 5.0 MGD or greater

- T.M. - trace metals
- NA - indicates information not available
- BL - No change from background level
- TDS - Total Dissolved Solids
- I/D - Intake/Discharge

Total Dissolved Solids, BOD, in mg/l

Source: Survey Scope Study of Wastewater Management Chicago-South End Lake Michigan Area (Corps of Engineers: Chicago District, February 1972), pp 4-3, 4-4, 4-5.

standards have consistently been violated over the years, a study of the annual trends shows improvement of water quality in recent years. This is due to the expansion of treatment facilities and the addition of more advanced treatment processes at the different wastewater treatment plants.

The Little Calumet River, its tributaries and Burns Harbor also carry their waters to Lake Michigan. The water quality in these channels show less violations of standards than the Grand Calumet River System. The degradable parameters showed no violations of the standards except at station LCR-13 at the Illinois-Indiana state line. Non-degradable parameters showed occasional violations, especially in relation to the phosphorus, fecal coliforms, iron, and mercury. The water quality in the Little Calumet River System, over the years, has not shown the remarkable decrease in recent years as was noticed in the Grand Calumet River System. Phosphorus, however, is one of the few parameters that did show remarkable decrease after 1972 due to a state-wide ban. However, the 1973 and 1974 values of phosphorus still were in violation of the standards in most of the stations.

The water quality data of the tributaries to the Little Calumet River, Deep River, Turkey Creek, Salt Creek and Hart Ditch, showed more violations of the standards than the river itself. These tributaries receive several effluents of smaller wastewater treatment plants and industrial plants. The effect of these discharges on the water quality is readily noticed. It is essential at these plants to make the necessary changes and additions to eliminate any overloaded conditions and to introduce advanced treatment such as phosphorus removal, tertiary sand filtration, ammonia removal, and chlorination.

It is important to note that both the Grand Calumet River and Little Calumet River Basin are designated as "water quality limited segments". That is to say, the water quality does not meet applicable water quality standards. The Kankakee River Basin, on the other hand, is designated as "effluent limited segment" which means that the water quality is meeting applicable standards or there is adequate evidence that it will meet applicable standards after the application of effluent limitations, or waste load allocations. Load allocation studies have been made for the Grand Calumet River (Combinatorics, Inc.) and for the Little Calumet River (Steeg and Associates).

The problem constituents or parameters in the waters of the Grand and Little Calumet River Basins are biochemical oxygen demand (BOD), ammonia ($\text{NH}_3\text{-N}$), phosphorus (P), fecal coliforms (F.C.), phenols, cyanide, iron (Fe), and mercury (Hg). Some of these parameters are due to specific industrial discharges while others are characteristics of municipal wastewater treatment plant discharges.

Critical Areas Of Water Quality

The single most important water quality problem in the area is caused by discharges from industrial sources. The Grand Calumet River is the primary receiver of these discharges. To a lesser degree, the problem also exists in the Little Calumet River watershed. Thus the entire Lake Michigan Drainage Basin Area is affected.

The result is a degrading of Lake Michigan, the major source of drinking water and the major natural resource of the area. Lake Michigan is used extensively for swimming, fishing and sailing. The Indiana Harbor Canal is used for waste transport, drainage and as a shipping lane. The Grand Calumet River is only used to transport wastewater and stormwater, it has no

recreational uses. If nothing is done, the Grand Calumet - Indiana Harbor Canal will continue to be a detriment to the quality of life in the region and contribute to the degradation of Lake Michigan.

The problems posed by the large concentration of industrial discharges are repeated by municipal dischargers. The major municipal wastewater treatment plants in the area, Gary, Hammond, and East Chicago, have a design capacity to treat over 125 million gallons of wastewater per day. This concentration of municipal discharge in virtually the same area of the industrial discharges tends to compound the effects of the pollutions. Fecal Coliform levels have caused lake beaches in Whiting and Hammond to be closed for years. Fecal coliform is the primary water quality parameter used to determine whether waters are swimmable or not.

"208"

The Northwestern Indiana Regional Planning Commission's "208" program has as its major goal the development of a plan that is cost effective, implementable, and economically, socially, and environmentally sound. Also a management system for implementing the plan will be developed.

To meet these goals NIRPC is directing an intensive public participation program, the objective of which is to assure public input during the planning phase so that final plan will be acceptable.

The next major phase of the program is to develop options that may be used in meeting the 1983 goals. Projected date of completion is March, 1977. By May of 1977, plans should be developed for subareas within the Region, with area-wide plans being formulated by August. Adoption of the final plan is scheduled for November.

Conclusions

Based on the findings of the initial phase of the 208 program, certain conclusions have been reached. While water quality in study areas has improved in recent years, it still remains a problem in comparison with applicable standards. An active and responsible program on behalf of the industrial, municipal and private wastewater treatment plants, to improve the quality of effluent discharges into the receiving streams in the study area should prove to be beneficial for the reduction of pollution. This can be accomplished by the following: expansion of facilities to prevent overloaded conditions; addition of advanced treatment processes to treat constituents otherwise not removed in the primary and secondary treatment; providing trained and certified operators to assure the proper operation and maintenance of plant units; providing or securing laboratory services to test the necessary parameter required to determine plant operation and efficiency. On the other hand, an active and responsible program on behalf of the enforcing agencies to prepare proper and realistic standards with an efficient program of testing and enforcement should provide the often missing link in improving water quality. In addition, the implementation of a viable area-wide waste treatment management plan will insure that the water quality in this 208 study area will continue to improve during the next few years to allow the achievement of the 1983 goals of the Act.

In 1970 Congress passed the Clean Air Act, which established the National Ambient Air Quality Standards (NAAQS). Section 110 of the Act required states to submit a State Implementation Plan (SIP) detailing each state's strategy to bring air quality into compliance with the NAAQS. The Indiana State Board of Health-Air Pollution Control Division (APCD) submitted a SIP which was approved in 1973. This plan establishes air quality standards and procedures for meeting the NAAQS.

Implementation of the SIP is aided on the local level by city air quality agencies that monitor major sources of pollution and issue permits to industries. Recent activities and results of these agencies and the State APCD are summarized in this chapter. Other information includes climatic conditions which have an effect on air pollution, major sources of pollution, and a brief summary of the Region's air quality.

Gary Air Pollution Control Division

During 1976 the Engineering Division of the Gary APCD completed an Emission Inventory for major sources of pollution. This inventory helps staff members determine whether Gary city standards are sufficient to meet NAAQS. Gary's APCD used its enforcement program to bring three area companies into compliance with their permit allocations. The Technical Services Division completed an inventory of suspended particulates, sulfur dioxide and nitrogen dioxide which indicated a reduction of suspended particulates during the first six months of 1976.

Gary's air quality has generally improved. The total pollutants standard for the city is 75 micrograms per cubic meter. In 1965 total pollutants equalled 170. By 1970 that was reduced to 101; and by the end of 1975, total pollutants were down to 76.8 micrograms per cubic meter.

Hammond Air Pollution Control Division

During 1975 and the first six months of 1976, three of Hammond's six air quality sampling sites were in compliance with the primary air quality standards for particulates and nitrogen dioxides. Sulfur dioxide complied with primary and secondary standards. The Hammond agency maintains an inspection program that includes regular on-site inspections of all sources of pollution over 100 tons and daily surveillance patrols. On-site testing for specific parameters is conducted. In 1976 tests for hydrocarbons were conducted at five locations.

East Chicago Air Pollution Control Division

Several improvements in industrial treatment of emissions were brought about by the East Chicago APCD enforcement program. Inland Steel completed the installation of jumper pipes on all coke oven batteries. Inland Steel's Coke Battery B, one of the major sources of pollution in East Chicago, was taken out of service in compliance with an agreement between the company and local and state agencies. Other industrial improvements include a major repair and rehabilitation of the Basic Oxygen Furnace at Lykes Corporation, installation of equipment to control emissions from the open hearth operation at Blaw Knox, and installation of jumper pipes on all existing batteries at Lykes Corporation.

Improvements have also been made in East Chicago's monitoring program. An ozone monitor was put into operation after a major overhaul, and problems with sulfur dioxide monitoring have been eliminated.

State Board of Health - Air Pollution Control Division

The State Board of Health APCD oversees the operations of local agencies and directs all permit and enforcement procedures outside of Hammond and

East Chicago. The State's monitoring program is currently being expanded to provide more accurate data to aid in determining permit allocations and enforcing them.

APCD enforcement program has resulted in the installation of a sulfur dioxide scrubber system at NIPSCO's Mitchell plant. This system uses low sulfur coal which results in sulfur dioxide levels being in compliance for the Mitchell plant's emission allocations. U.S. Steel has also improved controls for emissions from their coke ovens. Tests on stack emissions from NIPSCO's Bailly plant were recently conducted and are being evaluated for possible control improvements.

Major Sources Of Air Pollution

The dominating industries in northwestern Indiana are steel mills and oil refineries and their supporting industries, all of which are major sources of air pollution. The 1970 emission survey for the State Implementation Plan indicates the following number of industries in each category:

Steel Foundries, Mills or Primary Metals Industries	-	12
Chemical Plants	-	9
Petroleum Industries	-	5
Power Plants	-	3
Cement Plant	-	1

Another major source is mobile pollutants of transportation. However, this source's simulated emissions data for northwestern Indiana indicate that the 1975 system emitted less pollutants than the State Implementation Plan allows transportation to radiate. These figures are based on actual 1969 data and were calculated in conjunction with an evaluation of the 1995 Transportation System Plan.

TABLE 11a :

MOTOR VEHICLE EMISSIONS

Existing Network Tons/Year

	<u>S.I.P.</u>	<u>Simulation</u>
CO	270,856	182,208
HC	38,832	22,849
NO	36,018	19,382

Source: Northwestern Indiana Regional Planning Commission, 1975 Air Quality Assessment of the 1995 Transportation System Plan, 1975

Table 11a shows the State Implementation Plan's standards and the simulated data for Northwest Indiana regarding carbon monoxide, hydrocarbons and nitrogen dioxide parameters.

Summary Of Air Quality In Northwest Indiana

Table 11b on the following page shows the amount of particulates, sulfur dioxide, carbon monoxide, hydrocarbons, and nitrogen dioxides emitted in 1970. Unfortunately, these totals cannot be compared to state standards because they are expressed in tons per year, and the standards are expressed in micrograms per cubic meter. Converting the standards and the pollutant measurements to a common factor would involve one of two methods: 1) an expensive computer modeling process which may be undertaken by the State Board of Health-APCD in the future, or; 2) comparing daily pollutant measurements which are not available for the five pollutants with the existing standards.

However, the data as presented does describe the types and amounts of pollutants detected in the region and characterizes emissions from specific sources.

TABLE 11b: 1970 EMISSION INVENTORY SUMMARY - NORTHWESTERN INDIANA
Pollutants in Tons/Year

	Particulate	SO ₂	CO	HC	NO ₂
<u>Fuel Combustion</u>					
Steam Electric Power (P)	7421	241291	1912	1010	63060
Commercial-Industrial (P)	49966	195772	504	3083	32370
Area Sources (A)	14691	17283	1814	785	5154
<u>Process Losses</u>					
Chemical (P)	217	10900	-	79	-
Petroleum (P)	2210	33086	263623	8932	3837
Mineral Products (P)	143307	10877	30	50	40
Metallurgical (P)	150192	3728	67888	15986	165
Other (P)	6110	-	-	1648	-
Solvent Evaporation (A)				9500	
<u>Solid Waste Disposal</u>					
On-Site Incineration (P)	17	2	23	17	2
Open Burning Dumps (A)	5087	318	27023	9537	1907
<u>Transportation</u>					
Motor Vehicle (Gasoline) (A)	1149	696	363715	59865	34457
Motor Vehicle (Diesel) (A)	236	424	3063	613	3205
Railroad (A)	182	472	509	363	545
Gasoline Handling Evaporation (A)	-	-	-	1253	-
Total Point	359440	495696	333980	30805	99474
Total Area	21345	19193	396124	81916	45268
GRAND TOTAL	380785	514849	730104	112721	144742

(A) = Area Source

(P) = Point Source

Source: The State of Indiana, Air Pollution Control Implementation Plan, Vol. I & II

Particulate emissions in the region totalled 380,785 tons per year. Industrial process losses accounted for 79 percent of the total, and power generating plants produced only 2 percent. Fuel combustion sources including power plants emitted 19 percent of total particulates. Sulfur dioxide emissions amounted to a total of 514,849 tons per year and power plants produced 46 percent of the total. Industrial and commercial fuel combustion sources excluding power plants caused 42 percent of the total sulfur dioxide. Air pollution as carbon monoxide totalled 730,104 tons per year; the major source categories were process losses with 45 percent and transportation with 50 percent. Nitrogen oxide emission from all categories amounted to 144,742 tons in 1970 with power plants and transportation as the major source categories with 44 percent and 26 percent of the total NO_2 , respectively. Total hydrocarbons were 112,721 tons with 32 percent coming from process losses and 55 percent from transportation sources. Lake County produced almost all the region's pollution for any category.

Photochemical oxidants are another measure of air quality, but data on these parameters is not available. Photochemical oxidants are smog products that result from the union of some compounds with oxygen. Other toxic substances which have been identified are lead, beryllium, arsenic and asbestos. None of these have been found in any appreciable amount in this area.

Because of the inability to compare these statistics with standards that are designed to prevent physically harmful effects, no definite conclusions can be drawn about the effects of these levels on the quality of life in northwest Indiana. Generally, too high a level of sulfur dioxide

can irritate the upper respiratory tract, and damage plant life. Extremely high concentrations of hydrocarbons are harmful to humans, but such concentrations (even if they do exist) are unlikely to stay in the atmosphere long enough to be poisonous. Nitrogen dioxide is a colored pollutant which can affect vision if present in sufficiently high levels. There is some indication that this pollutant can be harmful to human lungs. The most commonly known photochemical oxidant is ozone. High levels of it can cause coughing, choking, headache and severe fatigue as well as damage to plants.

As more knowledge about the levels of air pollutants that cause damage is developed, a more definitive analysis of the Region's air quality will be possible.

Climate And It's Affects

The annual average rainfall for northwestern Indiana is 37.45 inches. The average temperature is 50.3°F. Prevailing winds are generally westerly in flow, with an average speed of 10.3 miles per hour. As mentioned in the Water Quality Chapter, rain can "wash" air pollutants down into the lakes, rivers and streams in the area thereby compounding the water quality problem.

Another influence of the local climate is the effect that the lake breeze has on air pollution. Called a 'climatic anomaly', the lake breeze occurs mainly during the warm season daytime when the prevailing winds are light and the land is warmer than Lake Michigan. When a breeze blows inland from over the lake, it is cooled by the relatively cold lake water. This cooler air traps the warmer land air, causing an "inversion" which means air pollution is trapped over the area instead of dispersing with the breeze. When an inversion occurs, pollution levels increase and compounds any affect they normally have. This is what caused the ozone alerts that the Region experienced last summer. A detailed explanation of this climatic anomaly is included in Appendix H.

APPENDIX A

BACKGROUND INFORMATION:
DEMOGRAPHICS AND INCOME

HISTORICAL POPULATION STATISTICS

STATE OF INDIANA

<u>1970</u>	<u>1960</u>	<u>1950</u>	<u>1940</u>	<u>1930</u>	<u>1920</u>	<u>1910</u>	<u>1900</u>
5,193,669	4,662,498	3,934,224	3,427,796	3,238,503	2,930,390	2,700,876	2,516,462

GARY-HAMMOND SMSA

<u>1970</u>	<u>1960</u>	<u>1950</u>	<u>1940</u>	<u>1930</u>	<u>1920</u>	<u>1910</u>	<u>1900</u>
633,367	573,548	408,228	321,031	284,131	180,213	103,404	57,067

LAKE COUNTY

	<u>1970</u>	<u>1960</u>	<u>1950</u>	<u>1940</u>	<u>1930</u>	<u>1920</u>	<u>1910</u>	<u>1900</u>
TOTAL	546,253	513,269	368,152	293,195	261,310	159,957	82,864	37,892
CALUMET	215,940	210,844	150,258	119,458	103,268	55,790	17,982	1,408
CENTER	21,946	17,184	11,047	6,804	5,540	4,312	3,602	3,372
HOBERT	40,825	39,223	21,871	12,472	9,135	5,621	3,729	2,718
NORTH	203,480	204,101	162,157	139,602	132,752	84,743	48,361	21,020
ROSS	28,845	14,854	6,676	3,482	1,996	1,440	1,434	1,542
ST. JOHN	16,829	12,282	5,799	3,468	2,105	1,778	1,766	1,765

PORTER COUNTY

	<u>1970</u>	<u>1960</u>	<u>1950</u>	<u>1940</u>	<u>1930</u>	<u>1920</u>	<u>1910</u>	<u>1900</u>
TOTAL	87,114	60,279	40,076	27,836	22,821	20,256	20,540	19,175
CENTER	25,191	19,422	15,490	10,486	9,287	7,422	7,971	7,222
JACKSON	1,540	965	781	715	656	741	894	938
LIBERTY	3,260	2,439	1,666	1,267	1,009	888	881	877
PINE	3,098	3,052	2,154	911	686	468	564	634
PORTAGE	28,371	13,724	5,501	2,647	1,343	984	959	1,014
UNION	2,077	1,741	1,341	1,005	909	973	1,069	938
WESTCHESTER	13,652	10,899	6,827	3,817	3,817	3,319	2,953	2,445

Source: U.S. Department of Commerce, Bureau of the Census. 1900-1970.

PER CAPITA INCOME STATISTICS - 1972 ESTIMATES

<u>LAKE COUNTY</u>		<u>PORTER COUNTY</u>	
TOTAL	\$ 3,785	TOTAL	\$ 4,033
CALUMET	3,405	CENTER	4,368
CENTER	3,889	JACKSON	4,372
HOBART	3,755	LIBERTY	4,374
NORTH	4,050	PINE	3,973
ROSS	4,457	PORTAGE	3,765
ST. JOHN	3,921	UNION	3,588
		WESTCHESTER	4,239
<u>STATE OF INDIANA</u>		<u>GARY-HAMMOND</u>	<u>SMSA</u>
TOTAL	\$ 3,070	TOTAL	\$ 3,172

Source: U.S. Department of Commerce, Bureau of the Census, County and City Data Book, 1972.

APPENDIX B

STATE BOARD OF HEALTH POPULATION FORECASTS

CZM TOWNSHIP POPULATION FORECASTS

CZM TOWNSHIP EMPLOYMENT FORECASTS

STATE BOARD OF HEALTH POPULATION FORECASTS

STATE OF INDIANA

<u>1970</u>	<u>1980</u>	<u>1990</u>	<u>2000</u>
5,193,669	5,575,400	6,086,600	6,582,100

GARY - HAMMOND SMSA

<u>1970</u>	<u>1980</u>	<u>1990</u>	<u>2000</u>
633,400	666,900	719,500	767,000

LAKE COUNTY

<u>1970</u>	<u>1980</u>	<u>1990</u>	<u>2000</u>
546,300	559,100	578,800	585,700

PORTER COUNTY

<u>1970</u>	<u>1980</u>	<u>1990</u>	<u>2000</u>
87,100	107,800	140,700	181,300

1975 CENSUS POPULATION ESTIMATES

GARY-HAMMOND SMSA - 640,400

POPULATION PROJECTIONS

LAKE COUNTY

	<u>1970</u>	<u>1980</u>	<u>1990</u>	<u>2000</u>
TOTAL	546,253	589,000	642,550	681,100
CALUMET	215,940	222,000	232,400	240,700
CENTER	21,946	30,700	34,150	35,200
HOBART	40,825	44,650	46,650	50,300
NORTH	203,480	210,950	218,255	221,100
ROSS	28,845	35,950	47,850	52,600
ST. JOHN	16,829	23,950	34,850	46,200

PORTER COUNTY

	<u>1970</u>	<u>1980</u>	<u>1990</u>	<u>2000</u>
TOTAL	87,114	108,700	130,450	150,700
CENTER	25,191	30,850	36,950	41,750
JACKSON	1,540	2,300	3,400	4,500
LIBERTY	3,260	4,850	7,550	10,500
PINE	3,098	3,200	3,300	3,450
PORTAGE	28,371	35,850	39,700	43,700
UNION	2,077	2,550	3,250	3,900
WESTCHESTER	13,652	17,050	21,600	25,950

Source: Northwestern Indiana Regional Planning Commission

NON-FARM INDUSTRY EMPLOYMENT FORECASTS

LAKE COUNTY

Township and year	Manufac- turing	T.C.U.	Trade	Service and F.I.R.E.	Government	Other
<u>CALUMET</u>						
1980	41,770	5,935	13,490	9,810	10,240	6,355
1990	44,520	6,085	14,365	10,535	10,815	6,480
2000	46,820	6,085	15,040	11,550	11,365	6,840
<u>CENTER</u>						
1980	275	395	1,050	2,210	425	145
1990	500	395	1,200	3,300	525	230
2000	600	395	1,925	4,025	575	280
<u>HOBART</u>						
1980	150	375	1,505	1,445	1,230	495
1990	150	375	1,720	1,735	1,280	740
2000	200	375	1,795	1,750	1,305	775
<u>NORTH</u>						
1980	63,020	7,160	16,795	11,955	7,840	9,630
1990	68,045	7,170	17,820	12,515	7,865	9,735
2000	72,445	7,195	17,995	12,915	8,065	10,185
<u>ROSS</u>						
1980	1,375	00	5,440	3,950	1,695	590
1990	3,275	00	5,990	6,150	1,695	540
2000	4,575	00	7,665	7,675	1,695	540
<u>ST. JOHN</u>						
1980	270	80	2,255	1,960	550	285
1990	1,370	105	3,655	2,385	550	235
2000	2,670	105	4,705	3,085	775	410

PORTER COUNTY

<u>CENTER</u>						
1980	2,670	545	4,220	5,265	910	490
1990	2,870	545	5,895	6,010	1,085	195
2000	3,470	545	7,225	6,600	1,110	150
<u>JACKSON</u>						
1980	00	00	30	45	25	00
1990	00	00	80	45	25	00
2000	00	00	125	50	25	00
<u>LIBERTY</u>						
1980	25	30	20	50	50	25
1990	50	30	70	50	50	25
2000	175	30	70	50	50	25
<u>PINE</u>						
1980	00	60	35	30	00	00
1990	00	60	35	30	00	00
2000	00	60	35	30	00	00
<u>PORTAGE</u>						
1980	3,910	670	1,510	870	760	280
1990	6,910	1,070	1,985	1,070	860	305
2000	9,910	1,770	2,535	1,120	860	305
<u>UNION</u>						
1980	25	00	15	20	40	00
1990	25	00	25	25	50	00
2000	25	00	25	25	55	20
<u>WESTCHESTER</u>						
1980	10,045	405	2,040	1,100	930	380
1990	11,845	405	2,390	1,450	1,030	380
2000	16,045	405	3,090	2,100	1,130	230

SOURCE: Northwestern Indiana Regional Planning Commission, Small Area Population and Employment Forecasts for Northwestern Indiana, 1975

INVENTORY OF CULTURAL FACILITIES IN CZM STUDY AREA

COUNTY: LAKE

TOWNSHIP: CALUMET

Type of Facility	Name	Location
HISTORICAL SITES	Gary Land Company Office	E. 4th Ave. & Pennsylvania, Gary
	Doll House Fire Station	W. 5th Ave. & Pierce, Gary
	Gateway Park	Broadway & 4th Ave., Gary
	Marquette Park	
	Miller Milk Station	Miller Ave. & Lake St., Gary
LIBRARIES	Prarie School Style House	600 Filmore St., Gary
	Gary Public Library (Main Office)	220 W. 5th Ave., Gary
	Alcott Branch	703 E. 21st. Ave., Gary
	Bailey Branch	1501 Madison St., Gary
	Brunswick Branch	4435 Tri-City Plaza
	Kennedy Branch	3953 Broadway
	Roosevelt Branch	610 W. 25th Ave.
	Tolleston Branch	1113 Taft St.
	Wildermuth Branch	301 S. Lake St.
	Griffith Branch-Lake County Public Library	940 N. Broad St., Griffith
	Black Oak Branch-Lake County Public Library	5921 W. 25th Ave.
	41st Ave.Branch-Lake County Public Library	3491 W. 41st Ave.

INVENTORY OF CULTURAL FACILITIES IN CZM STUDY AREA

COUNTY: LAKE

TOWNSHIP: CENTER

Type of Facility	Name	Location
HISTORICAL SITES		
	Lake County Court House	Crown Point
	Ye Old Homestead	227 S. Court St., Crown Point
	Solon Robinson Memorials	21 W. Court & 105 N. Court, Crown Point
LIBRARIES		
	Crown Point Public Library	214 S. Court St., Crown Point
MUSEUMS		
	Ye Old Homestead	227 S. Court St., Crown Point

INVENTORY OF CULTURAL FACILITIES IN CZM STUDY AREA

COUNTY: LAKE

TOWNSHIP: HOBART

Type of Facility	Name	Location
LIBRARIES		
	East Gary Branch-Lake County Public Library	2400 Central Ave., East Gary
	Hobart Branch-Lake County Public Library	100 Main St., Hobart
	New Chicago Branch-Lake County Public Library	Michigan & Huber Blvd., New Chicago
MUSEUM		
	Hobart Historical Society Museum	706 E. 4th St., Hobart

INVENTORY OF CULTURAL FACILITIES IN CZM STUDY AREA

COUNTY: LAKE

TOWNSHIP: NORTH

Type of Facility	Name	Location
ART GALLERY	Art Center	Kennedy & Chicago Avenues, East Chicago
HISTORICAL SITES	Site of First Blast Furnace, Inland Steel Forest Avenue First Mayor's House Little Red School House Monument of 1821 Meat Packing Plant Site Oldest House	3210 Watling, East Chicago 165th to Little Calumet, Hammond 229 Ogden St., Hammond Hessville Park, Hammond State Line & Lake Michigan, Hammond East of State Line Ave., Hammond 3 Sibley Blvd., Hammond
LIBRARIES	E. Chgo. Library, Main Office Baring Avenue Branch Calumet Branch Grand Blvd. Branch Hammond Public Library, Main Office Brooks House Branch Hansen Branch Harrison Park Branch Howard Branch Jefferson Branch Keeler Branch Lincoln Branch Riley Branch Rupp Branch Sawyer Branch Wilson Branch Highland Branch -Lake County Public Library Munster Branch-Lake County Public Library Whiting Public Library	2401 E. Columbus Ave. Chicago & Baring Ave., East Chicago 4751 Alexander St., East Chicago 3601 Grand Blvd., East Chicago 564 State St., Hammond 1047 Conkey St., Hammond 2823 Martha St., Hammond 436 Conkey St., Hammond 7047 Grand Ave., Hammond 6940 Northcote Ave., Hammond 4807 Oak Ave., Hammond 4221 Towle Ave., Hammond 1245 River Drive, Hammond 847 - 117th St., Hammond 649 Mulberry St., Hammond 1317 - 173rd St., Hammond 2841 Jewett St., Highland 8701 Calumet Ave., Munster 1735 Oliver St., Whiting

INVENTORY OF CULTURAL FACILITIES IN CZM STUDY AREA

COUNTY: LAKE

TOWNSHIP: ROSS

Type of Facility	Name	Location
HISTORICAL SITES		
	McGwinn's Indian Village	276 E. 68th Pl., Merrillville
	Deep River-Woods Mill	Rt. 330, Ross Township
	Woodrabe Cemetary	County Line Rd., Ross Township
LIBRARIES		
	Merrillville Branch-Lake County	
	Public Library	70 E. 68th Pl., Merrillville
	Independence Hill Branch-	
	Lake County Public Library	7985 Marshall St., Merrillville
	Lake County Reference	
	Library	1919 W. Lincoln Highway, Merrillville

INVENTORY OF CULTURAL FACILITIES IN CZM STUDY AREA

COUNTY: LAKE

TOWNSHIP: ST. JOHN

Type of Facility	Name	Location
HISTORICAL SITES		
	Ideal Sect. of Highway on U.S.30, 15 Mi. W. of U.S. 41	Dyer
	First Church Building	9400 Wicker Ave., St. John
LIBRARIES		
	Dyer Branch-Lake County Public Library	2005 Hart St., Dyer
	St. John Branch-Lake County Public Library	9450 Wicker Ave., St. John
	Schererville Branch-Lake County Public Library	121 E. Joliet St., Schererville

INVENTORY OF CULTURAL FACILITIES IN CZM STUDY AREA

COUNTY: PORTER

TOWNSHIP: CENTER

Type of Facility	Name	Location
HISTORICAL SITES	Memorial Opera House	122 E. Indiana Ave., Valparaiso
	Old County Jail	102 E. Indiana Ave., Valparaiso
	Porter County Courthouse	Valparaiso
	Sauk Trail Marker	Michigan St., Valparaiso
	Valparaiso University, Old Campus	College & Freeman St., Valparaiso
LIBRARIES	Porter County Public Library	107 Jefferson, Valparaiso
	Valparaiso Public Library	107 Jefferson, Valparaiso
MUSEUM	Porter County Historical Museum-Old County Jail	102 E. Indiana, Valparaiso
OPERA HOUSE	Civic Opera House	651 College Ave., Valparaiso

INVENTORY OF CULTURAL FACILITIES IN CZM STUDY AREA

COUNTY: PORTER

TOWNSHIP: JACKSON

Type of Facility

Name

Location

HISTORICAL SITES

Charles Osborn's Grave
Tratebus Mill (Long Mill)

Quakerdom Cemetery
Tratebus Road, 250 East Road

INVENTORY OF CULTURAL FACILITIES IN CZM STUDY AREA

COUNTY: PORTER

TOWNSHIP: LIBERTY

Type of Facility

Name

Location

HISTORICAL SITES

Butternut Spring

175 West Road & 650 North Road

INVENTORY OF CULTURAL FACILITIES IN CZM STUDY AREA

COUNTY: PORTER

TOWNSHIP: PINE

Type of Facility

Name

Location

NO FACILITIES

INVENTORY OF CULTURAL FACILITIES IN CZM STUDY AREA

COUNTY: PORTER

TOWNSHIP: PORTAGE

Type of Facility	Name	Location
HISTORICAL SITES	Wolf Homestead	450 West Road & 700 North Road
LIBRARIES	Portage Branch-Porter County Public Library	Portage Mall

INVENTORY OF CULTURAL FACILITIES IN CZM STUDY AREA

COUNTY: PORTER

TOWNSHIP: UNION

Type of Facility	Name	Location
HISTORICAL SITES	Huffman's Mill	750 West Road

INVENTORY OF CULTURAL FACILITIES IN CZM STUDY AREA

COUNTY: PORTER

TOWNSHIP: WESTCHESTER

Type of Facility	Name	Location
HISTORICAL SITES		
	Bailey Homestead	Howe Rd. & U.S. 20, Westchester Twp.
	Ecology Coves	Indiana Dunes State Park, Westchester Twp.
	Little Fort Marker	S.R. 49, Westchester Twp.
LIBRARIES		
	Chesterton Branch-Westchester Twp. Public Library	125 2nd St.
	Porter Branch-Westchester Twp. Public Library	305 Franklin

INVENTORY OF EDUCATIONAL FACILITIES

INVENTORY OF EDUCATIONAL FACILITIES IN CZM STUDY AREA

COUNTY: LAKE

TOWNSHIP: CALUMET

Municipality	Type of School	Name	Location
Gary	Public	Aetna Elementary	1327 Arizona
		Ambridge Elementary	370 Rutledge
		Bailey Jr. High School	4621 Georgia
		Banneker Elementary	1912 W. 23rd Ave.
		Bethune Elementary	2367 E. 21st Ave.
		Beveridge Elementary	1234 Cleveland
		Bilingual Education Center	640 Jefferson
		Brunswick Elementary	5701 W. 7th Ave.
		George W. Carver School	2535 Virginia
		Chase Elementary	711 Chase
		Douglas Elementary	2700 Jackson
		Drew Elementary	2065 Mississippi
		Dunbar Elementary	917 E. 17th Ave.
		Duncan Elementary	1110 W. 21st Ave.
		Early Learning Center	1320 E. 19th Ave.
		Edison Elementary	W 5th Ave. & Burr
		Emerson High School	716 E. 7th Ave.
		Benjamin Franklin Elementary	600 E. 35th Ave.
		Froebel School	W 15th Ave. & Madison
		Garnett School	2131 Jackson
		Gary Tech. Vocational School	1800 E. 35th Ave.
		Horace Mann High School	524 Garfield
		Glen Park Elementary	3910 Broadway
		Ivanhoe Elementary	5700 W. 15th Ave.
		Jefferson Intermediate	640 Jefferson
		Jefferson School	601 Jefferson
		Kennedy-King School	301 Park
		Duny Elementary	5050 Vermont
		Lew Wallace High School	415 W. 45th Ave.
		Lincoln Elementary	1988 Polk
		Locke Elementary	3757 W. 21st Ave.
		Marquette Elementary	6401 Hemlock
		Martin Luther King High School	1616 Broadway
		Melton Elementary	4581 Filmore
		Miller Elementary	665 S. Lake Street
		Nobel Elementary	8837 Pottowatami Trail
		Norton Elementary	1356 Harrison Blvd.
		Pittman Square Elementary	4948 Delaware
		Pulaski School	1867 Georgia
		Ernie Pyle Elementary	2545 W. 19th Ave.
		James Whitcomb Riley Elem.	1301 E. 43rd Ave.
		T. Roosevelt High School	730 W. 28th Ave.
		Spaulding Elementary	660 Rhode Island
		Tolleston School	1700 Taney
		Vohr Elementary	1900 W. 7th Ave.
		George Washington Elem.	13th Ave. & Wright
		Daniel Webster Elementary	3720 Pierce Street
		West Side High School	W. 9th Ave. & Gerry St.
		Daniel Williams Elementary	1320 E. 19th Ave.
		Wirt School	210 N. Grand Blvd.

INVENTORY OF EDUCATIONAL FACILITIES IN CZM STUDY AREA

COUNTY: LAKE

TOWNSHIP: CALUMET

Municipality	Type of School	Name	Location
Gary	Private (Catholic)	Holy Angels Cathedral School	975 W. 6th Ave.
		Holy Family School	3721 Delaware St.
		Holy Rosary School	725 Clark Road
		Holy Trinity School	423 W. 12th Ave.
		St. Hedwig School	1724 Pennsylvania St.
		St. Joseph the Worker School	4460 Delaware St.
		St. Mark School	511 W. Ridge Road
		St. Mary of the Lake School	6070 Miller Ave.
		St. Monica School	2254 Adams St.
	(Non-Catholic)	Seventh Day Adventist School	70 W. 46th Ave.
Griffith	Special Schools	Lake County Assoc. for Retarded Children (school)	2650 W. 35th Ave.
		Trade Winds Rehabilitation Center, Inc. (school)	5901 W. 7th Ave.
	Colleges	Indiana University NW	3400 Broadway
	Public	Beirider Elem. School	600 N. Lillian
		Eldon Ready Elementary	1345 N. Broad St.
		Franklin Elementary	200 N. Broad St.
		Griffith Jr. High School	600 N. Raymond
		Griffith Sr. High School	600 N. Wiggs
		Wadsworth Elementary	600 N. Jay
	Private	St. Mary School (Catholic)	525 N. Broad St.
Unincorporated Area	Public	Black Oak Elementary	2900 Burr
		Calumet High School	3900 Calhoun
		Dulles Elementary	5700 W. 23rd Ave.
		Grissom Elementary	7201 W. 25th Ave.
		Hossford Park Elementary	4735 Arthur
		Lake Jr. High School	3601 W. 41st Ave.
		Longfellow Elementary	45th Ave. & Calhoun
		Ridge Jr. High School	6111 W. Ridge Road
	Private	Calumet Baptist School	47th & Whitcomb
		Gary Lutheran	1150 W. 49th Ave.
		Blessed Sacrament School (Catholic)	4101 Garfield
		St. Ann School (Catholic)	6001 W. 25th Ave.

INVENTORY OF EDUCATIONAL FACILITIES IN CZM STUDY AREA

COUNTY: LAKE

TOWNSHIP: CENTER

Municipality	Type of School	Name	Location
Crown Point	Public	Douglas McArthur School	Fairbanks & 129th Ave. (Cedar Lake)
		Crown Point High School	400 W. Joliet St.
		Lake Street Elementary	475 Lake Street
		Timothy Ball School	E. North & East St.
		Robt. A. Taft Jr. High School	1000 S. Main St.
		Solon Robinson School	Wells & Pettibone
		South Ward Elementary	311 S. Court St.
Unincorporated Area	Private	St. Mary School (Catholic)	405 E. Joliet St.
		Trinity Lutheran	250 S. Indiana Ave.
	Special Schools	Lake County Assoc. for Retarded Children	2150 W. 125th Ave.

INVENTORY OF EDUCATIONAL FACILITIES IN CZM STUDY AREA

COUNTY: LAKE

TOWNSHIP: HOBART

Municipality	Type of School	Name	Location
East Gary	Public	Alexander Hamilton Elem.	2900 Lake St.
		Carl J. Polk School	2460 Vermillion
		Central Elementary	2520 Pike
		Edison Sr. High School	3304 Parkside
		Virgil I. Bailey Elem.	2100 Union
		Edison Jr. High School	2540 Pike
Hobart	Private	St. Francis Xavier (Catholic)	2453 Putnam St.
	Public	Foreman Elementary	301 E. 10th St.
		George Earle Elementary	400 N. Wilson
		Liberty Elementary	130 N. Liberty
		Mundell Elementary	52 N. Wisconsin
		Ridge View Elementary	3333 W. Ridge Road
		Hobart Jr. High School	705 E. 4th St.
		Hobart Sr. High School	36 E. 8th St.
	Private	St. Bridget School (Catholic)	107 Main St.
		Trinity Lutheran School	Hobart
New Chicago	Public	John Ivan Meister Elementary	33rd & Jay St.
		River Forest Elementary	Indiana St. & Huber Blvd.
		River Forest High School	Indiana St. & Huber Blvd.
		River Forest Jr. High School	Indiana St. & Huber Blvd.
	Special Schools	Cerebral Palsy of Northwest Indiana, Inc.	22 Tyler St.

INVENTORY OF EDUCATIONAL FACILITIES IN CZM STUDY AREA

COUNTY: LAKE

TOWNSHIP: NORTH

Municipality	Type of School	Name	Location
East Chicago	Public	Abraham Lincoln Elementary	1908 E. 136th St.
		Benjamin Franklin School	4215 Alder St.
		Benjamin Harrison Elementary	4406 Indianapolis Blvd.
		George Washington High School	1611 E. 140th St.
		James Whitcomb Riley Elem.	3810 Elm St.
		Joseph L. Block Jr. H.S.	2700 Cardinal Dr.
		Carrie Gosch Elementary	455 E. 148th St.
		Columbus Elementary	712 E. Columbus Dr.
		Eugene Field Elementary	3551 Block Ave.
		George Washington Elem.	1610 E. Columbus Dr.
		Mark Town Elementary	3005 Spruce St.
		Roxanna Addition School	5636 Magoun St.
		Theodore Roosevelt H.S.	4020 Indianapolis Blvd.
		William McKinley Elem.	4825 Magoun St.
	Private	Holy Trinity School (Catholic)	4742 Carey St.
		Immaculate Conception School (Catholic)	4860 Olcott Ave.
		Indiana Harbor Catholic Elem.	3916 Pulaski St.
		St. Mary School (Catholic)	820 W. 144th St.
		St. Stanislaus School (Catholic)	4940 Indianapolis Blvd.
	Colleges	Indiana University NW.	3901 Indianapolis Blvd.
Hammond	Public	Columbia Elementary	1238 Michigan St.
		Thomas Edison Elem.	7025 Madison Ave.
		Benjamin Franklin School	1649 Indianapolis Blvd.
		Gavit Jr. & Sr. H.S.	175th & Northcote Ave.
		George Rogers Clark School	1921 Davis
		Hammond High School	5926 Calumet Ave.
		Henry Eggers Middle School	5825 Blaine Ave.
		Warren Harding School	3211 E. 165th St.
		Washington Irving Elem.	4727 Pine Ave.
		James Whitcomb Riley Elem.	1245 River Drive, North
		Thomas Jefferson Elementary	6940 Northcote
		Kenwood Elementary	6416 Hohman Ave.
		Lafayette Elementary	862 Sibley Blvd.
		Lee Caldwell Elementary	3105 E. 173rd Street
		Lincoln Elementary	4221 Towle Ave.
		Maywood Elementary	6040 Howard Ave.
		Miller Elementary	6530 New Hampshire Ave.
		Morton Elementary	7006 Marshall Ave.
		Morton Middle School	7040 Marshall Ave.
		Morton Senior High School	6915 Grand Ave.
		Orchard Drive Elementary	3640 Orchard Drive
		Gene Stratton Porter Elem.	2321 E. 171st Street
		Riverside Elementary	741 Michigan Street
		Scott Middle School	3635 E. 173rd Street
		A.L. Spohn Middle School	4925 Sohl Ave.

INVENTORY OF EDUCATIONAL FACILITIES IN CZM STUDY AREA

COUNTY LAKE TOWNSHIP NORTH

Municipality	Type of School	Name	Location
Hammond	Public	Technical-Vocational	5727 Sohl Ave.
		Lew Wallace Elementary	736 Conkey St.
		Washington Elementary	41 Williams St.
		Woodrow Wilson Elementary	1317 E. 173rd Street
	Private	St. Paul's Lutheran School	5848 Erie St.
		Hammond Baptist Grade School (Catholic)	700 Sibley Blvd.
		Our Lady of Perpetual Help	7128 Arizona Ave.
		St. Casimir School	4329 Cameron Ave.
		St. Catherine of Siena	6525 Kentucky Ave.
		St. John Bosco School	1247 E. 171st Place
		Bishop Noll Institute	1519 Hoffman St.
	Colleges	Purdue University-Calumet Campus	2233 E. 171st St.
		Calumet College	2400 New York Ave.
Highland	Public	Highland High School	9135 Erie St.
		Highland Jr. High	2941 - 41st Ave.
		Judith M. Johnston Elementary	2945 Grand Blvd.
		Lincoln Elementary	2450 Lincoln Ave.
		Mildred Merkley Elementary	5th & 42nd Ave.
		Orchard Park Elementary	8720 Orchard Ave.
		Southridge Elementary	9221 Johnston. St.
		Allen J. Warren Elementary	2901-100th St.
	Private	Our Lady of Grace (Catholic)	3025 Highway Ave.
		Highland Christian School	3040 Ridge Road
	Special School	Lake County Association for Retarded Children	9600 Kennedy Ave.
Munster	Public	James B. Eads School	8001 Harrison
		Ernest R. Elliot School	8718 White Oak
		Frank H. Hammond School	1301 Franklin Parkway
		Lanier School	1040 Ridge Road
		Munster Sr. High School	8808 Columbia
		Wilbur Wright Middle High Sch.	8824 Columbia
	Private	St. Thomas Moore School (Catholic)	8501 Calumet Ave.
Whiting	Public	Primary McGregor School	1831 Oliver
		Whiting Jr. & Sr. High School	1800 New York
		Whiting South Side School	2640 White Oak Ave.

INVENTORY OF EDUCATIONAL FACILITIES IN CZM STUDY AREA

COUNTY Lake

TOWNSHIP NORTH

Municipality	Type of School	Name	Location
Whiting	Private	(Catholic)	
		Immaculate Conception School	2022 Schrage Ave.
		Sacred Heart School	1717 LaPorte Ave.
		St. Adalbert School	2118 Indpls. Blvd.
		St. John the Baptist School	1844 Lincoln Ave.

INVENTORY OF EDUCATIONAL FACILITIES IN CZM STUDY AREA

COUNTY LAKE

TOWNSHIP ROSS

Municipality	Type of School	Name	Location
Merrillville	Public	Henry P. Fieler School	407 W. 61st Ave.
		Harrison Jr. High School	1400 W. 61st Ave.
		Homer Iddings Elementary	7249 Van Buren St.
		Jonas E. Saulk Elementary	3001 West 77th Ave.
		Merrillville Sr. High School	276 East 68th Ave.
		Edgar L. Miller School	5901 Waite
		Pierce Jr. High School	199 E. 70th Place
	Private	(Catholic)	
		Andrean High School	5959 Broadway
		Aquinas Elementary	801 W. 73rd Ave.
Unincorporated Area		St. Michael School	557 W. 57th Ave.
		S.S. Peter and Paul School	5855 Harrison St.
		John Wood Elementary	6100 East 73rd Ave.

INVENTORY OF EDUCATIONAL FACILITIES IN CZM STUDY AREA

COUNTY LAKE

TOWNSHIP ST. JOHN

Municipality	Type of School	Name	Location
Dyer	Public	Kohler Middle School Roscoe Protsman	534 Joliet St. 1121 Harrison St.
	Private	St. Joseph School (Catholic)	432 Joliet St.
St. John	Public	Kolling Elementary School Lake Central High School	8400 Wicker Ave. 8400 Wicker Ave.
	Private	St. John Evangelist (Catholic)	9400 Wicker Ave.
Schererville	Public	Homan Elementary Peiser Elementary	East Joliet St. Cline Ave.
	Private	Hammond Baptist High School Baptist City Grade School	134 Joliet St. 134 Joliet St.
	College	St. Michael School (Catholic)	16 W. Wilhelm
		Hyles-Anderson College	134 W. Joliet St.

INVENTORY OF EDUCATIONAL FACILITIES IN CZM STUDY AREA

COUNTY PORTER

TOWNSHIP CENTER

Municipality	Type of School	Name	Location
Valparaiso	Public	Central Elementary	305 Franklin St.
		Cook's Corner Elementary	358 Bulls-Eye Lake Road
		Benjamin Franklin Jr. High School	605 Campbell Rd.
		Thomas Jefferson Jr. High School	1600 Roosevelt Rd.
		Thomas Jefferson Elementary	1700 Roosevelt Rd.
		Memorial Elementary	Park & Milton
		Northview Elementary	257 Northview Drive
		Parkview Elementary	1405 Wood St.
		Valparaiso High School	2727 North Campbell
	Private	St. Paul School (Catholic)	Chicago & Academy Sts.
		Emmanuel Lutheran School	1700 N. Monticello
	Special Schools	Porter County Special Education Cooperative School	605 Beech St.
		Porter County Association for Retarded Children (School)	816 Union St.
	Colleges	Valparaiso University	651 College Ave.
		Valparaiso Technical Institute	West Chestnut
Unincorporated Area	Public	Flint Lake Elementary	
		Hayes-Leonard Elementary	
	Special School	Shults-Lewis Children's Home and School, Inc.	County Road 150 East

INVENTORY OF EDUCATIONAL FACILITIES IN CZM STUDY AREA

COUNTY PORTER

TOWNSHIP JACKSON

Municipality	Type of School	Name	Location
Unincorporated Area	Public	Jackson School	County Road 400 East

INVENTORY OF EDUCATIONAL FACILITIES IN CZM STUDY AREA

COUNTY PORTER

TOWNSHIP LIBERTY

Municipality	Type of School	Name	Location
Unincorporated Area		Liberty Middle School	900 North Road
		Liberty Elementary	900 North Road

INVENTORY OF EDUCATIONAL FACILITIES IN CZM STUDY AREA

COUNTY PORTER

TOWNSHIP PINE

Municipality	Type of School	Name	Location
Beverly Shores	Public	Beverly Shores Elementary	Marine Avenue
Pines	Public	Pine Elementary	Brown Road

INVENTORY OF EDUCATIONAL FACILITIES IN CZM STUDY AREA

COUNTY PORTER

TOWNSHIP PORTAGE

Municipality	Type of School	Name	Location
Portage	Public	Portage High School	5962 Central Ave.
		Wallace Aylesworth Jr. High School	5910 Central Ave.
		William Fegely Jr. High School	5384 Stone Ave.
		Crisman Elementary	2240 Crisman Rd.
		Central Elementary	2825 Russell St.
		Ethel R. Jones Elementary	2734 McCool Rd.
		Garyton Elementary	5391 Central Ave.
		Rowena Kyle Elementary	2701 Hamstrom Rd.
		George L. Myers Elementary	3100 E. Willowdale
		Nativity of Our Savior School (Catholic)	Willowcreek Road
	Private		
Unincorporated	Public	Grissom Middle School	U.S. 6 & Airport Rd.
		South Haven Elementary	395 W. Midway Drive
		Paul Saylor Elementary	Midway & Devonshire

INVENTORY OF EDUCATIONAL FACILITIES IN CZM STUDY AREA

COUNTY PORTER

TOWNSHIP UNION

Municipality	Type of School	Name	Location
Unincorporated Area	Public	Wheeler Jr. & Sr. High School Union Center Elementary	Wheeler 600 West Road

INVENTORY OF EDUCATIONAL FACILITIES IN CZM STUDY AREA

COUNTY PORTER

TOWNSHIP WESTCHESTER

Municipality	Type of School	Name	Location
Beverly Shores	Public	Beverly Shores Elementary	Marine Ave.
Chesterton	Public	Chesterton Senior High School	700 W. Morgan
		Westchester Middle School	1050 S. 5th St.
		Bailly Elementary	800 S. 5th St.
		Brummitt Elementary	600 W. Morgan
	Private	St. Patrick School (Catholic)	N. Calumet Rd.
		Fairhaven Christian Academy	E. Oakhill Rd. & S.R. 49
Porter	Public	Newton Yost Elementary	Sherman & Beam Streets

APPENDIX D

INVENTORY OF RECREATIONAL FACILITIES

INVENTORY OF RECREATIONAL FACILITIES IN CZM STUDY AREA

COUNTY: LAKE

TOWNSHIP: CALUMET

Type of Facility	Facility	Location
Golf Courses	Gleason Park North	Harrison & 32nd Ave., Gary
	Gleason Park South	34th & Jefferson Ave., Gary
	Colonial Golf Center, Inc.	1901 N. Cline Ave., Griffith
	Calumet Golf Club	3920 W. Ridge Road
Parks	Aetna Park	Gary
	Aetna Playground	Gary
	Borman Park	Gary
	Brunswick Park	Gary
	Buffington Park	Gary
	Carolina Park	Gary
	Duneland Park	Gary
	East Glen Park Field	Gary
	Gateway Park	Gary
	Georgetown Park	Gary
	Hatcher Park	Gary
	Howe Park	Gary
	Idle Hour Playground	Gary
	Indian Boundary & Randolph Playground	Gary
	Ironwood Park	Gary
	Jackson Park	Gary
	Knox Park	Gary
	MannBridge Park	Gary
	Marquette Park	Gary
	Marshalltown Playground	Gary
	Means Playground	Gary
	Nichols Place Park	Gary
	Norton Park	Gary
	Patcher Park	Gary
	Pittman Square Park	Gary
	Pulaski Park	Gary
	Pulaski Playground	Gary
	Rees Park	Gary
	Roosevelt Park	Gary
	Ryan Park	Gary
	Schleicher Park	Gary
	Sunrise Park	Gary
	Tarrytown Playground	Gary
	Tolleston Park	Gary
	Washington Park	Gary
	Westbrook Park	Gary
	Westbrook Ballfield	Gary
	William Fisher Park	Gary
	Gleason Park	Gary
	2nd & Pierce St. Playground	Gary
	3rd & Dallas St. Tot Lot	Gary

INVENTORY OF RECREATIONAL FACILITIES IN CZM STUDY AREA

COUNTY: LAKE

TOWNSHIP: CALUMET

Type of Facility	Facility	Location
Parks	13th & Hovey St. Playground	Gary
	13th & Washington St. Tot Lot	Gary
	16th & Adams St. Tot Lot	Gary
	16th & Van Buren St. Tot Lot	Gary
	19th & Hovey St. Playground	Gary
	23rd & Rutledge St. Tot Lot	Gary
	26th & Maryland St. Park	Gary
	50th & Madison St. Playground	Gary
	51st & Martin Luther King Dr. Playground	Gary
	Central Park	Griffith
	J.C. Tot Lot	Griffith
	South Park	Griffith
	Woodsworth Park	Griffith
	Little Calumet River Park	Calumet Township
Recreation Centers	Gary Metropolitan YMCA	225 W. 5th Ave., Gary
	Suburban YMCA	4800 Harrison Ave., Gary
	Gary YMCA	30 E. 6th Ave., Gary
	Mansards Racquet Club	1111 Rehome, Griffith

INVENTORY OF RECREATIONAL FACILITIES IN CZM STUDY AREA

COUNTY: LAKE

TOWNSHIP: CENTER

Type of Facility	Facility	Location
Golf Courses	Oak Knoll Golf Club	11200 W. 5th Ave.
	Pheasant Valley Country Club	3838 W. 141st Ave.
	Youche Country Club	133rd & Marshall St.
Parks	Bridgeport Park	Crown Point
	North Street Park	Crown Point
	Sauerman's Woods Pool	Crown Point
	Wells Street Park	Crown Point
	Lake County Fair Grounds	Crown Point
	Lemon Lake Park	Center Township
Recreation Centers	NONE	

INVENTORY OF RECREATIONAL FACILITIES IN CZM STUDY AREA

COUNTY: LAKE

TOWNSHIP: HOBART

Type of Facility	Facility	Location
Golf Courses	Crossmore Country Club	Goin-Wisconsin
Parks	Central Playground	East Gary
	Columbus Park	East Gary
	Joel Mock Park	East Gary
	Miller Playground	East Gary
	Riverview Park	East Gary
	Well Site No. 7	East Gary
	Well Site No. 8	East Gary
	Brookview Park	Hobart
	City Ball Park	Hobart
	Englehart Park	Hobart
	Fred Rose 8th St. Park	Hobart
	Hellman Park	Hobart
	Lakeview Park	Hobart
	McAfee Park	Hobart
	Pensy Park	Hobart
	Robinson Park	Hobart
	49th & 6th Park	Hobart
	Tyler Street Park	New Chicago
	Cleveland Street Tot Lot	New Chicago
Recreation Center	Hobart YMCA	601 W. 40th Place, Hobart

INVENTORY OF RECREATIONAL FACILITIES IN CZM STUDY AREA

COUNTY: LAKE

TOWNSHIP: NORTH

Type of Facility	Facility	Location
Golf Courses	Todd Park	Indianapolis Blvd., E. Chgo.
	McArthur Golf	East Chicago
	Woodmar Country Club	1818 E. 177th St., Hammond
	Wicker Park	Indianapolis Blvd. & Ridge Road, Highland
Parks	Blaw Knox Playground	East Chicago
	Callahan Park	East Chicago
	City Hall Park	East Chicago
	Edward Valve Park	East Chicago
	E.J. Block Stadium	East Chicago
	E.S. & E. Park	East Chicago
	Goodman Park	East Chicago
	Kosciusko Park	East Chicago
	Lake Front Park	East Chicago
	Marktown Park	East Chicago
	McArthur Gold Park	East Chicago
	Riley Park	East Chicago
	Roxanna Playground	East Chicago
	Smith Park	East Chicago
	Sunnyside Park	East Chicago
	Todd Park	East Chicago
	Washington Park	East Chicago
	Baring Parkway Park	Hammond
	Central Park	Hammond
	Civic Center Park	Hammond
	Columbia Park	Hammond
	Douglas Park	Hammond
	Dowling Park	Hammond
	Edison Park	Hammond
	Forsythe Park	Hammond
	Gibson Park	Hammond
	Harding Park	Hammond
	Harrison Park	Hammond
	Hermits Park	Hammond
	Hessville Park	Hammond
	Indi-Illi Park	Hammond
	Irving Park	Hammond
	Jefferson Park	Hammond
	John F. Kennedy Park	Hammond
	Knickerbocker Parkway	Hammond
	Lake Front Park	Hammond
	Lewis Park	Hammond

INVENTORY OF RECREATIONAL FACILITIES IN CZM STUDY AREA

COUNTY: LAKE

TOWNSHIPS: NORTH

Type of Facility	Facility	Location
Parks	Maywood Park	Hammond
	Miller School Park	Hammond
	New Park Park	Hammond
	Phrommer Park	Hammond
	Purdue Park	Hammond
	River Bank Park No. 1	Hammond
	River Bank Park No. 2	Hammond
	Riverside Park	Hammond
	Triangle Park No. 1	Hammond
	Triangle Park No. 2	Hammond
	Turner Field	Hammond
	Wolf Lake Park	Hammond
	Brantwood Park	Highland
	Ellendale Park	Highland
	Homestead Park	Highland
	Lakeside Park	Highland
	NIPSCO Park	Highland
	Northwood Park	Highland
	Petit Park	Highland
	Southridge Park	Highland
	Wirth Park	Highland
	Wicker Park	Highland
	Beech Street Park	Munster
	Bieker's Park	Munster
	Bluebird Park	Munster
	Circle Park	Munster
	Evergreen Park	Munster
	Frank Hammond Park	Munster
	Lakewood Park	Munster
	Lanewood Park	Munster
	Munster Community Park	Munster
	Lawlor Park	Munster
	Orchard Park	Munster
	Plum Creek Park	Munster
	Ridgeway Park	Munster
	Sunnyside Park	Munster
	Triangle Park	Munster
	Atchison Avenue Park	Whiting
	Community Center Park	Whiting
	Schrage Avenue Park	Whiting
	South Side Park	Whiting
	Standard Athletic Field	Whiting
	Whiting Filtration Park	Whiting
	Whiting Lake Front Park	Whiting
	Whiting Municipal Park	Whiting

INVENTORY OF RECREATIONAL FACILITIES IN CZM STUDY AREA

COUNTY: LAKE

TOWNSHIPS: NORTH

Type of Facility	Facility	Location
Recreation Centers	Hammond Civic Center	5825 Soh1
	Hammond YMCA	7322 Southeastern
	Hammond YMCA	229 Ogden
	Whiting Community Center	1938 Clark St.

INVENTORY OF RECREATIONAL FACILITIES IN CZM STUDY AREA

COUNTY: LAKE

TOWNSHIPS: ROSS

Type of Facility	Facility	Location
Golf Courses	Turkey Creek Country Club	6400 Harrison, Merrillville
	Gary Country Club	6701 Taft, Merrillville
	Broadmoor Country Club	Route 30 & Whitcomb, M'ville.
	Indian Ridge Country Club	6363 Grand Blvd.
Parks	Deep River Park	Unincorporated Area
	Old Mill Park	Unincorporated Area
Recreation Centers	Southlake Tennis Club	8328 Colorado

INVENTORY OF RECREATIONAL FACILITIES IN CZM STUDY AREA

COUNTY: LAKE

TOWNSHIP: ST. JOHN

Type of Facility	Facility	Location
Golf Courses	Sherwood Golf Club	600 E. Joliet
	Lake Hills Golf & Country Club	Parrish St.
Parks	Elmer Miller Park	Dyer
	Northgate Park	Dyer
	Lorimer Park	St. John
	Bingo Lake	St. John
	Civic Park	St. John
	Peter Redar Memorial Park	St. John
Recreation Center	OMNI	U.S. 41, Schererville

INVENTORY OF RECREATIONAL FACILITIES IN CZM STUDY AREA

COUNTY: PORTER

TOWNSHIP: JACKSON

Type of Facility

Facility

Location

NO FACILITIES

INVENTORY OF RECREATION FACILITIES IN CZM STUDY AREA

COUNTY: PORTER

TOWNSHIP: LIBERTY

Type of Facility	Facility	Location
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NO FACILITIES		
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INVENTORY OF RECREATIONAL FACILITIES IN CZM STUDY AREA

COUNTY: PORTER

TOWNSHIP: CENTER

Type of Facility	Facility	Location
Golf Courses	Forest Park Municipal Course	1155 Sheffield Dr., Valpo.
	Mink Lake Golf Course	S.R. 49, Center Twp.
	Valparaiso Country Club	County Rd.450 N.-Center Twp.
Parks	Berkeley Park	Valparaiso
	Forest Park	Valparaiso
	Glenrose Park	Valparaiso
	Jessie-Pilfer Park	Valparaiso
	Kerchoff Park	Valparaiso
	Ogden Gardens	Valparaiso
	Rogers-Lakewood Park	Valparaiso
	Tower Park	Valparaiso
	Will Park	Valparaiso
Recreation Centers	Mink Lake Park	Valparaiso
	Porter County Fair Grounds(old)	Valparaiso
	Porter County YMCA	109 Washington, Valpo.

INVENTORY OF RECREATIONAL FACILITIES IN CZM STUDY AREA

COUNTY: PORTER

TOWNSHIP: PINE

Type of Facility	Facility	Location
Golf Courses	0	
Parks	Beverly Shores Park No. 1	Beverly Shores
	County Line Road Beach	Beverly Shores
	Derby Ditch Beach	Beverly Shores
	Drake Avenue Beach	Beverly Shores
	Drexwood Ave. Beach	Beverly Shores
	Lake Shore Park	Beverly Shores
	Lithuanica Park	Beverly Shores
	The Plaza Beach	Beverly Shores
	Shore Avenue Beach	Beverly Shores
	State Park Road Beach	Beverly Shores
	Pines Park	Pines
Recreation Centers	0	

INVENTORY OF RECREATIONAL FACILITIES IN CZM STUDY AREA

COUNTY: PORTER

TOWNSHIP: PORTAGE

Type of Facility	Facility	Location
Golf Courses	0	
Parks	Hickory Park	Portage
	Perry Park	Portage
	Stagecoach Park	Portage
	Woodland Park	Portage
Recreation Centers	Portage YMCA	6450 Evergreen, Portage

INVENTORY OF RECREATIONAL FACILITIES IN CZM STUDY AREA

COUNTY: PORTER

TOWNSHIP: UNION

Type of Facility

Facility

Location

NO FACILITIES

INVENTORY OF RECREATIONAL FACILITIES IN CZM STUDY AREA

COUNTY: PORTER

TOWNSHIP: WESTCHESTER

Type of Facility	Facility	Location
Golf Courses	0	
Parks	Shadipide Tot Lot	Burns Harbor
	Hagland Tot Lot	Burns Harbor
	NIB Tot Lot	Burns Harbor
	Chesterton Park	Chesterton
	Coffee Creek Park	Chesterton
	Dogwood Park	Chesterton
	Thomas Centennial Park	Chesterton
	Indiana Dunes State Park	Chesterton
	Indiana Dunes National Lakeshore	Chesterton
	Hawthorne Park	Porter
	Pratt Lake Park	Porter
Recreation Centers	Westchester YMCA	215 Roosevelt

INVENTORY OF SPECIAL ATTRACTIONS

VALPARAISO
CHAPEL OF THE RESURRECTION

651 College
Valparaiso University campus
219/462-5111

Mosaics, Etched glass; and one of the midwest's largest pipe organs are located in the ultra-modern design of the world's largest college church.

WILBUR H. CUMMINGS MUSEUM OF ELECTRONICS

One Center Street on Technical Institute Campus
219/461-5111

One of many electronic exhibits dating from early 1900's to present day is the "Frankenstein Machine" located in this museum. The museum is on the site where Edison built the first electric generating station in the Midwest.

LAKEWOOD PARK

North Campbell Street
219/462-5144

An excellent spot for a picnic, the Park is shaded by many lovely trees. Boating and ice skating are permitted on over 120 acres.

THE PINES SKI AREA

Off Indiana Toll Road, 1 mile west and 1 mile south of
junction of U.S. 6 and S.R. 49.
219/462-1465

A complete and modern facility. Five slopes to 1400 feet are also well lighted for night skiing. A modern chalet, two ski shops, equipment rental and ski school are also included.

CROWN POINT
LAKE COUNTY COURT HOUSE

South Main Street
219/663-0389

One of the most massive designs built by early settlers; it is a combination of Victorian, Romanesque and Georgian architecture.

THE OLD HOMESTEAD

227 South Court Street
219/633-0456

Antique furnishings create an atmosphere of early 1800's. A well-preserved home.

GARY
FRANK LLOYD WRIGHT HOUSE

7th. and Van Buren Streets
(Not open to public)

Wright's designs range from traditional to ultra-modern. Viewed from road only, this house is example of Wright's early work.

GARY-HOBART WATER TOWER

Seventh and Madison Streets

Combination of imaginative design and functional use in this award-winning architecture.

RICHARD HATCHER ART GALLERY

2137 Broadway
Community Resource Center
219/885-0591

Professional artists from the Calumet region show their work here. Art classes, dance, karate and drama instructions are also available.

PANORAMA FROM I-80 AND I-90

Passersby can view miles of industrial manufacturing facilities and experience a panorama of industrial power.

CHESTERTON
GILBERT GALLERY
115 South Fourth Street

Features works by Porter County Association of Artists and Craftsmen. Includes a variety of different arts and crafts.

INDIANA DUNES STATE PARK
U.S. 12, S.R. 49
219/926-1215

Three miles of sandy beach on Lake Michigan includes sand dunes, moving and fixed, densely forested areas- and almost the entire list of midwestern trees and shrubs constitute this State Park.

INDIANA DUNES NATIONAL LAKESHORE

U.S. 12 E. of S.R. 48 Three miles
219/926-7561

Several areas of active, exposed dunes provide visitors a chance to view nature's handicraft at work. Five thousand acres of the proposed 8,300 have been acquired in this developing National Lakeshore on Lake Michigan.

HUNTING, FISHING, BOATING, CAMPING

LAKE COUNTY

Pine Crest Marina, Inc.
Cedar Lake, Indiana
Season: March 1 - November 1

850 Acre lake. All forms of boating allowed. Marina, public boat ramp, light camping facilities - toilets & water, grills, picnicking. Grocery supplies within 10 miles, public phone, fuel supplies.

Duncan's Lake, Inc.
Box 12
Schneider, Indiana 46376
Season: May 1 to September 30

This is a 41 acre fishing lake with 50 campsites. There is a swimming beach; also a playground. The campsites include electrical connections, hot showers, flush toilets, laundry facilities, and sanitary disposals.

PORTER COUNTY

Indiana Dunes State Park
Contact: Hiram I. McDaniel, Property Manager
Indiana Dunes State Park
Route 332
Chesterton, Indiana 46304

Three mile shoreline, 2,182 acres, 362 campsites, swimming, complete recreation area.

Lefty's Coho Landing
6161 Burns Ditch
Portage, Indiana 46368
Season: Open all year

All types of boats are permitted on the lake.

Deep River Interpretive Nature Center
Old Lincoln Highway
73rd Avenue and Porter County Line Road
Deep River, Indiana

This nature center includes aquatic displays, wildlife slides, fossil displays, wildlife displays and an 8,000 old mastodon which is the feature display of the Nature Center. The displays are constantly changed and updated.

EVENTS

WINTER:

State Slalom Races
Valparaiso (Porter County)

The State Slalom Title is at stake in these races located three miles north of Valparaiso on Meridian Road.

Contact: Dave Johnson
Pines Ski Lodge
Route 7, Box 36
Valparaiso, Indiana 46383

SPRING:

No annual events listed.

SUMMER:

Lake County Fair
Crown Point (Lake County)

Displays, rides, concerts, a demolition derby and livestock show and competition combine to make this the most popular annual event in Northwest Indiana.

Contact: Lake County Commissioners
Lake County Government Complex
Crown Point, Indiana 46307

Porter County Fair
Valparaiso (Porter County)

Midway rides and games, 4-H art, crafts and livestock displays and competition and the Miss Porter County Fair contest highlight one of the best county fairs in the State.

Contact: Porter County Commissioners
County Courthouse
Valparaiso, Indiana 46383

AUTUMN:

International Salon of Photography
Hammond (Lake County)

Photographers from all over the world compete for the best of show in each division, awards and honorable mention.

Contact: Anthony J. Radich, Director
Northern Indiana Art Association
5446 Hohman Avenue
Hammond, Indiana 46320

APPENDIX E

TRANSPORTATION, MAJOR PLANNED IMPROVEMENTS

INDIANA STATE HIGHWAY COMMISSION
CAPITAL IMPROVEMENT PROGRAM FOR LAKE AND PORTER COUNTIES

July 1, 1976 through June 30, 1978

ABOUT THE PROGRAM

The method of listing projects which are included in this capital improvement program provides information on location of the facility and anticipated work activities on it during the biennium extending from July 1, 1976 through June 30, 1978. The information is given in the following manner:

Column 1 - Index Number - This is a sequential number for the various items listed in the program and is for identification purposes. An asterisk (*) preceding the index number indicates a new project now being added to the capital improvement program.

Column 2 - Road Number - This identifies that state highway road number on which the proposed improvement is located.

Column 3 - Program Activity - This identifies the type of activity included in the program.

- (a) Advance studies (AS) includes location studies, improvement studies, socio-economic studies, and environmental impact studies as required for the specific projects.
- (b) Plan Development (PD) includes the actual design and development of right-of-way and construction plans for the projects.
- (c) Land Acquisition (LA) includes the title searches, parcel description preparation and actual acquisition of needed rights-of-way for the projects.
- (d) Construction (CN) includes the preparation of contract documents, acceptance of bids, and awarding of construction contracts for the projects. Upon award of a construction contract, the project moves out of the capital improvement program listings.

Also, the scheduling of each of the work activities is noted by:

- (a) An asterisk (*) indicating project phase on which work has been completed.
- (b) An "X" indicating project phase on which work is currently underway and which will be continued during the biennium.
- (c) A numeral 1, 2, or 3 indicating project phase on which work is anticipated to start in first (1) portion of biennium, or in mid portion (2) of biennium, or in latter portion (3) of the biennium.
- (d) A dash (-) indicating a future phase of work that will be included in a subsequent capital improvement program.

Column 4 - Description - This notes the location and type of the proposed improvement. Added comments indicate special conditions or requirements on specific projects.

Column 5 - Project Number - This indicates presently assigned project numbers for the improvement. An asterisk preceding the project designation indicates the intended use of State Primary Road funds on the project.

Column 6 - Structure Number - This indicates the number presently assigned to the bridge included in the item.

Column 7 - District - Indicates State Highway District in which the proposed improvement is located. (C) Crawfordsville, (G) Greenfield, (F) Fort Wayne, (L) LaPorte, (S) Seymour, (V) Vincennes.

Column 8 - County - Indicates the County or Counties in which the proposed improvement is located.

Major projects placed in the Capital Improvement Program progress over a span of 7 to 10 years through (1) advance studies (location studies, socio-economic studies, environmental impact studies); (2) plan development (right-of-way and construction plans, specifications and cost estimate preparation); (3) land acquisition (ownership investigations, preparation of parcel descriptions, appraisals and actual acquisition of needed rights-of-way) and; (4) construction contract award.

Very complex urban projects normally require added time while minor spot improvements or bridge repairs will progress to construction in 2 to 4 years.

The rate of advancement of projects involving the use of Federal-Aid Funds is dependent upon receipt of Federal approvals, and upon the Federal-Aid Highway Funds made available to Indiana by Congressional appropriation and allocated by the Federal Highway Administration. As noted in footnotes on several projects, the Federal requirements for urban transportation planning must be met to obtain Federal approvals for major projects in the metropolitan areas of over 50,000 population.

Also, advancement of a project to plan preparation, land acquisition, or construction phases will be dependent upon agreement by local road and street authorities of the return to local control portions of the old state highways being replaced by the proposed new facilities. Formal return of portions of the old routes no longer serving as state highways will take place upon the completion of the new facility and will be undertaken in keeping with the requirements of Senate Enrolled Act 92 of the Second Regular Session 99th General Assembly 1976.

Other footnotes on certain projects indicate joint construction or coordination of work with the U.S. Corps of Engineers, National Park Service, county or municipality.

ESTIMATED PROGRAM ACTIVITY COSTS

PRELIMINARY ENGINEERING	\$ 44,000,000
LAND ACQUISITION	78,600,000
CONSTRUCTION	<u>200,000,000</u>
TOTAL	\$322,600,000

	FEDERAL AID	STATE FUNDS	TOTAL
INTERSTATE ROUTE PROJECT COSTS	\$ 13,500,000	\$ 1,500,000	\$ 15,000,000
PRIMARY ROUTE PROJECT COSTS	70,000,000	76,000,000	146,300,000
URBAN ROUTE PROJECT COSTS	58,200,000	29,100,000	87,300,000
SECONDARY ROUTE PROJECT COSTS	24,600,000	12,300,000	36,900,000
NON FEDERAL AID PROJECT COSTS	000	37,100,000	37,100,000
TOTAL COSTS FOR PROPOSED PROJECT ACTIVITIES	\$166,300,000	\$156,300,000	\$322,600,000

ALSO ADDITIONAL CONSTRUCTION CONTRACTS WILL BE AWARDED AS REQUIRED FOR SECOND AND THIRD STAGE CONSTRUCTION ON ROUTE SEGMENTS ON WHICH FIRST STAGE CONSTRUCTION IS NOW UNDERWAY. THIS IS PARTICULARLY PERTINENT TO CONSTRUCTION ON INTERSTATE ROUTES.

INDEX NO.	ROAD NO.	PROGRAM ACTIVITY				DESCRIPTION	PROJECT NUMBER	STRUCTURE NUMBER	DIST. COUNTY	
		AS	PC	LA	CN					
35	8	*	1	*	2	Repairs to bridge over Cobbs Creek, 0.6 mile east of USR 231	ST-232(A)	8-64-1847B	L	Porter
51	12	X	2	-	-	Replacement of lift bridge over Indiana Harbor Canal, 0.5 mile north of USR 20	*BRU-367(14)PE	12-45-6535	L	Lake
52	12	*	*	*	1	Repairs to bridge over Grand Calumet River, 1.9 miles east of SR 312	ST-367(M)	12-45-1629A	L	Lake
53	12	*	*	*	1	Repairs to bridge over CSS & SB RR, 3.2 miles west of SR 53	ST-367(6)	12-45-2080A	L	Lake
54	12 Spur	*	*	X	3	From 15th Ave. to USR 12 in Gary (Joint project with City) (Length 0.5 mile) - <i>I-65 EXTENSION</i>	ST-1147A PE, RW, CN		L	Lake
83	20	*	X	*	1	Repairs to bridges over Kennedy Ave. and IHB RR, 1.6 miles west of SR 912	ST	20-45-2484	L	Lake
84	20	1	2	-	-	Spot improvement at Lake-Porter County Line Road (Length 0.3 miles)	HHS-193(19)PE		L	Lake & Porter
124	30	*	X	2	-	Roadway modernization and access control from IR 65 to east junction with SR 49 (Length 14.8 miles)	*RFU-17(46)PE		L	Lake & Porter
125	30	*	X	2	-	Roadway modernization and access control from east junction with SR 49 to USR 421 (Length 7.5 miles)	*RF-77(35)PE		L	Porter & LaPorte
210	41	*	1	3	-	Roadway modernization and access control from south junction with SR 2 to Cedar Lake (Length 8.5 miles)	*RF-69(68)PE		L	Lake
211	41	*	*	*	1	Repairs to bridge over Penn-Central RR, 1.3 miles north of USR 30	ST-69-I	41-45-1030A	L	Lake
212	41	*	X	*	1	Repairs to bridge over C&O RR & Erie RR, 4.9 miles north of USR 30	ST	41-45-2039	L	Lake
246	49	*	1	*	2	Repairs to bridge over Ahlgrim Ditch, 3.1 miles north of SR 8	ST-77-B-(1)	49-64-1949A	L	Porter
247	49	X	1	-	-	From USR 30 to IR 80 (Length 8.0 miles)	*STF-165(24)PE		L	Porter
248	49	X	3	-	-	From USR 20 to USR 12 (Requires co-ordination with National Park Development) (Dependent upon annual federal certification of urban transportation study) including: Bridge over USR 20 (Length 0.8 mile)	*F-165(19)PE(2)RW (22)CN	49-64-5804	L	Porter
249	49	*	X	*	1	Repairs to bridges over USR 12 and CSS & SB RR	ST-180(C)	49-64-1027 & 1028	L	Porter
261	51	1	3	-	-	From IR 94 to USR 20 including: Bridge over Burns Ditch Bridge over N & W RR (Length 0.6 mile) (Dependent upon annual federal certification of urban transportation study)	U-	51-45-3474 51-45-2118	L	Lake

INDEX NO.	ROAD NO.	PROGRAM ACTIVITY				DESCRIPTION	PROJECT NUMBER	STRUCTURE NUMBER	DIST. COUNTY	
		AS	PD	LA	CN					
265	53	*	X	3	-	Replacement of bridge over Turkey Creek, 2.3 miles north of USR 30	*U-93(24)PE	53-45-12B	L	Lake
270	55	X	1	3	-	Replacement of bridge over Greasleton Ditch, 2 miles south of SR 2	RS	55-45-6259	L	Lake
321	I-65	*	*	*	1	Repairs to bridges over Penn-Central RR at IR 80	I-65	I-65-266-2327A	L	Lake
322	I-65	*	*	*	1	Repairs to bridges and ramp bridges at IR 80	I-65	I-65-266-4911A & DRA	L	Lake
366	I-80	1	2	*	3	Repairs to bridge over Harrison Ave., 0.4 mile west of USR 41	ST	I-80-01-3805A	L	Lake
367	I-80	1	2	*	3	Repairs to bridge over Northcote Ave., 0.3 mile west of SR 152	ST	I-80-02-3804A	L	Lake
368	I-80	X	3	-	-	Spot improvement at interchange with USR 41 (Dependent upon annual federal certification of urban transportation study)	I-80		L	Lake
369	I-80	*	X	*	2	Repairs to bridge at USR 41 on Calumet Avenue	ST	41-45-3238	L	Lake
370	I-80	X	3	-	-	Modification of interchange at SR 912 (Dependent upon annual federal certification of urban transportation study)	I-80-1(67)PE		L	Lake
371	I-80	*	*	*	1	Repair to bridge over IR 65	I-80	I-80-11-5036	L	Lake
372	I-80	*	*	*	1	Repair to bridges over Clay Street	I-80	I-80-13-3854	L	Lake
373	I-80	*	*	*	1	Repair to bridges over Burns Ditch	I-80	I-80-12-3853	L	Lake
374	I-80	*	*	*	1	Repairs to bridge over Penn-Central RR at IR 65	I-80	I-80-11-2186	L	Lake
375	I-80	*	*	*	1	Repair to bridges over Central Ave. and M.C. RR	I-80	I-80-12-2187	L	Lake
404	149	1	3	-	-	From USR 30 to SR 130 (Length 2.5 miles)	RS-171(14)PE		L	Porter
424	231	X	1	3	-	Replacement of bridge over Kankakee River at Porter-Jasper County Line	*RF-515(7)PE	231-64-548	L	Porter & Jasper
488	912	*	X	*	2	Repairs to bridges over Little Calumet River, 0.2 mile south of IR 80	ST-831(D)PE,CN	912-45-4464	L	Lake
489	912	*	*	*	1	Repairs to bridge at IR 80	ST	912-45-3671	L	Lake
490	912	*	X	*	2	Repairs to bridges over 25th Ave., 0.3 mile north of IR 80	ST-831(E)PE,CN	912-45-4465A	L	Lake
491	912	*	X	*	2	Repairs to bridges over N&W RR, 2.0 miles south of USR 20	ST-831(E)PE,CN	912-45-2219A	L	Lake

INDEX ROAD NO.	912	PROGRAM ACTIVITY			DESCRIPTION	PROJECT NUMBER	STRUCTURE NUMBER	DIST.	COUNTY
		AS	PD	LA CN					
492	912	*	X	* 2	Repairs to bridges over 15th Ave., 1.1 miles south of USR 20	ST-831(F)PE,CN	912-45-5613A	L	Lake
493	912	*	X	* 2	Repairs to bridges at 165th St., 0.6 mile south of USR 20	ST-831(C)PE,CN	912-45-4861A	L	Lake
494	912	*	X	* 2	Repairs to bridges over Penn-Central RR, 0.2 mile south of USR 20	ST-831(C)PE,CN	912-45-2216A	L	Lake
495	912	*	X	X 1	From USR 12 to Michigan Ave. interchange (Dependent upon annual federal certification of urban transportation study) (See note on following project) (Length 1.1 mile)			L	Lake
496	912	*	X	X 2	From Michigan Ave. interchange northwesterly to Indiana Toll Road (IR 90) (Dependent upon annual federal certification of urban transportation study) (Length 3.3 miles) NOTE: First phase construction of segments of SR 912 will be undertaken in biennium with rate of continuing construction on total route being dependent upon increase in Federal Urban High Density Traffic Route Funds or alternative source of funding.	*MM-850(22)PE,RW *MM-850(23)PE		L	Lake
497	912	1	2	- -	Replacement of lift bridge over Indiana Harbor Canal on Dickey Place in East Chicago (dependent upon annual federal certification of urban transportation study)	*BRU-850(17)PE	912-45-6549	L	Lake

NORTHWESTERN INDIANA REGIONAL PLANNING COMMISSION,

Annual Element of ACTIONS Program

FEDERAL AID INTERSTATE

Road Identification	Project Description	Phase	Total Cost	Federal Share	Local Share
I-80	Spot Improvement at Interchange with U.S. 41 in Lake County	PE	\$10,000	\$9,000	State \$1,000
I-80	Repair to Bridges over Burns Ditch, Central Avenue and Penn Central Railroad and over Clay Street in Lake County	CN	\$1,550,000	\$1,318,000	State \$232,000
I-80	Repair to Bridges over Ramp from I-65, over Penn Central Railroad at the I-80 and I-65 Interchange in Lake County	CN	\$1,160,000	\$986,000	State \$174,000
I-80	Modification of Interchange at SR 912 in Lake County	CN	\$310,000	\$264,000	State \$46,000
I-80	Repairs to Bridge over Northcote Avenue, 2.1 Mile East of the Indiana-Illinois State Line in Lake County	PE	\$8,000	-0-	State \$8,000
I-80	Repairs to Bridge over Harrison Avenue, 0.4 Mile West of U.S. 41 in Lake County	CN	\$260,000	\$221,000	State \$39,000
I-65	Repairs to Bridges over Penn Central Railroad and Ramp Bridges at I-80 in Lake County	CN	\$494,000	\$420,000	State \$74,000
I-80	Repairs to Bridge at U.S. 41 on Calumet Avenue in Lake County	CN	\$188,000	\$160,000	State \$28,000

Total
Federal \$4,248,000
Local \$3,599,000
State \$ 649,000

FEDERAL AID URBAN

Road Identification	Project Description	Phase	Total Cost	Federal Share	Local Share
165th & Calumet Ave.	Intersection Improvement at the Intersection of 165th Street and Calumet Avenue in Lake County	CN	\$185,000	\$129,500	Hammond \$55,500
Ridge Road	Modernization of Ridge Road from City Limits on Grant Street East to Mississippi Street City Limits in the City of Gary in Lake County	CN	\$1,100,000	\$770,000	Gary \$330,000
165th & Summer Street	Modernization of the Intersection at 165th and Summer Street in the City of Hammond in Lake County	CN	\$230,000	\$151,000	Hammond \$69,000
Vale Park Calumet Ave. Roosevelt Rd. Glendale Bd.	Construction to Widen and Resurface or Reconstruct Calumet, Roosevelt and Glendale and Realign Vale Park Drive to Provide a More Acceptable Angle of Intersection with Calumet Avenue and Roosevelt Road all in the City of Valparaiso in Porter County	R/W	\$90,000	\$63,000	Valparaiso \$27,000
Calumet Ave. and Evans Ave.	Modernization of Intersection at Calumet Avenue and Evans Avenue in Valparaiso in Porter County	CN	\$2,178,000	\$1,524,000	Valparaiso \$654,000
Ridge Rd.	Construction of Pavement and Modernization of Traffic Signal on Ridge Road from Calumet Avenue to State Line in Munster in Lake County	PE	\$61,500	\$43,050	Valparaiso \$18,450
Calumet Ave.	Modernization of Roads and Installation of Traffic Control Signals at the Intersection of Calumet Avenue with 45th Avenue in Munster within Lake County	CN	\$1,100,000	\$770,000	Munster \$330,000
Columbia Ave.	Installation of Traffic Control Signals at the Intersection of Columbia Avenue and Broadmore Avenue in the Town of Munster in Lake County	PE	\$75,000	\$52,500	Munster \$22,500
FAU Roads in Munster	Design and Installation of Traffic Control Signs on all Federal Aid Urban Routes in the Town of Munster in Lake County	PE	\$6,000	\$4,200	Munster \$1,800
173rd and Indpls. Blvd.	Reconstruction and Traffic Signal Modernization at the Intersection of 173rd Street and Indianapolis Blvd. in Hammond in Lake County	PE	\$10,000	\$7,000	Munster \$3,000
		CN	\$60,000	\$42,000	Munster \$18,000
		CN	\$385,000	\$269,000	Hammond \$116,000

FEDERAL AID URBAN (cont'd)

Road Identification	Project Description	Phase	Total Cost	Federal Share	Local Share
165th and Kennedy	Modernization of the Intersection of 165th Street and Kennedy Avenue in Hammond in Lake County	CN	\$352,000	\$246,400	Hammond \$105,600
165th, Indpls. and Summer	Improvement of the Intersection on Indianapolis Boulevard with 165th Street, 167th Street, and Summer Street in Hammond in Lake County	CN	\$1,870,000	\$1,309,300	Hammond \$561,000
Intersections	Modernization of Traffic Signals at Various Locations in Hammond in Lake County	PE	\$22,500	\$15,750	Hammond \$5,750
		CN	\$220,000	\$154,000	Hammond \$66,000
Multi Sts.	Design and Installation of Traffic Control Signs on All Federal Aid Urban Routes in the Town of Highland in Lake County	PE	\$9,000	\$6,300	Highland \$2,700
Indpls. Blvd.	Improvement of the Pulman Standard Spur, and Penn Central Railroad Spur Crossings on Indianapolis Boulevard in the City of Hammond in Lake County	PE	\$14,000	\$14,000	Hammond -0-
		CN	\$126,000	\$126,000	Hammond -0-
165th St.	Improvement of the Penn Central Railroad Crossing on 165th Street in Hammond in Lake County	PE	\$30,000	\$30,000	Hammond -0-
		CN	\$270,000	\$270,000	Hammond -0-
Indiana Street	Modernization from Joliet Street (SR 8) to 101st Avenue in the City of Crown Point in Lake County	PE	\$24,000	\$15,800	Crown Point \$7,200
		CN	\$576,000	\$403,200	Crown Point \$172,800
Grant St.	Grant Street from I-80 and I-94 to 4th and 5th Streets, then East to Buchanan Street then North to I-90 in Gary, in Lake County	PE	\$205,000	\$143,500	Gary \$61,500
		R/W	\$595,000	\$416,500	Gary \$178,500
Crosstown Exp.	Preliminary Engineering from Crosstown Expressway from U.S. 20 to SR 51 in Gary in Lake County	PE	\$482,000	\$337,400	Gary \$144,600
SR 12	Repairs to Bridge over the Chicago, South Shore and South Bend Railroad, 3.2 Miles West of SR 53 in Gary, in Lake County	CN	\$540,000	\$540,000	State -0-

FEDERAL AID URBAN (cont'd)

Road Identification	Project Description	Phase	Total Cost	Federal Share	Local Share
U.S. 20	Repairs to Bridges over Kennedy Avenue and the Indiana Harbor Belt Railroad 1.6 Miles West of SR 912 in Hammond in Lake County	PE	\$15,000	\$10,500	State \$4,500
129th	Construct 129th Street from Calumet Avenue East to White Oak Avenue in Hammond in Lake County	CN	\$1,104,000	\$772,800	Hammond \$331,200
45th Avenue	Widening and resurfacing from Cline to Colfax	CN	\$ 713,800	\$449,000	Griffith \$264,800
Total			\$12,648,800		
Federal			\$ 9,096,400		
Local					
Hammond			\$ 1,311,050		
Gary			\$ 714,600		
Valparaiso			\$ 699,450		
Munster			\$ 375,300		
Highland			\$ 2,700		
Crown Point			\$ 180,000		
State			\$ 4,500		
Griffith			\$ 264,800		

FEDERAL AID URBAN PROJECT CARRYOVER*

Road Identification	Project Description
Railroad Ave.	From 151st Avenue to U.S. 20, Construction and Engineering
15th Avenue	Improvements from Broadway to Martin Luther King Drive.

URBAN HIGH DENSITY

Road Identification	Project Description	Phase	Total Cost	Federal Share	Local Share
SR 912	Baltimore and Ohio Railroad and Penn Central Railroad Track Relocation from U.S. 12 to Dickey Road in Gary and East Chicago, Lake County	CN	\$7,741,000	\$3,561,000	State \$4,180,000
SR 912	Utility Adjustment on SR 912, from Columbus Drive (U.S. 12) to Michigan Avenue in Gary and East Chicago, Lake County	CN	\$158,000	\$142,200	State \$15,800
SR 912	Construction of two (2) bridges, SR 912 Ramp Bridge over SR 912; and SR 912 Ramp Bridge over U.S. 12 at Intersection SR 912 and U.S. 12 in Lake County	CN	\$1,240,000	\$1,116,000	State \$124,000
SR 912	Construction of Roadway and Structure from Columbus Drive (U.S. 12) to Michigan Avenue in Gary and East Chicago in Lake County	CN	\$14,522,000	\$13,070,000	State \$1,452,000
SR 912	The driving of test piling for the Relocated SR 912 structure over the Indiana Harbor Canal in Lake County	CN	\$100,000	\$90,000	State \$10,000

Total \$23,761,000
Federal \$17,979,200
Local State \$ 5,781,800

URBAN HIGH DENSITY PROJECT CARRYOVER*

Road Identification	Project Description
U.S. 20	U.S. 20 spot improvement at Lake-Porter County Line Road

RAIL HIGHWAY PROTECTION

Road Identification	Project Description	Phase	Total Cost	Federal Share	Local Share
Crossings on EJ & E	The Installation of Railroad Crossbucks, Advance Warning Signs, and Pavement Markings for all Public Crossings of the Elgin, Joliet and Eastern Railroad on Federal Aid Routes Statewide	CN	\$26,000	\$23,400	State \$2,600
Crossings on IHB	The Installation of Railroad Crossbucks, Advance Warning Signs and Pavement Markings on all Public Crossings of the Indiana Harbor Belt Railroad on Federal Aid Routes in Lake County	PE	\$1,000	\$900	State \$100
Crossings on CSBSSRR	The Installation of Railroad Crossbucks, Advance Warning Signs and Pavement Markings for all Public Crossings of the Chicago, South Shore, and South Bend Railroad on Federal Aid Routes Statewide	CN	\$9,000	\$8,100	State \$900
Calumet	Reconstruction of the Penn Central Railroad Crossing on Calumet Avenue North of Morgan Street in the City of Valparaiso in Porter County	CN	\$14,000	\$12,600	State \$1,400
Crossings on GTW RR	Installation of Advance Warning Signs, Crossbucks and Pavement Markings on Federal Aid Route Crossings of the Grand Trunk Railroad in the Northwest Indiana Regional Planning Commission Area	PE	\$1,750	\$1,575	State \$175
		CN	\$33,250	\$29,925	State \$3,325

Total \$155,000
 Federal \$125,500
 Local \$ 8,500
 Valparaiso \$ 21,000

SECTION 3 CAPITAL PROGRAM

Applicant	Project Description	Total Cost	Federal Share	Local Share
Chicago, South Bend and South Shore RR	Rolling Stock Renewal - Commuter Rail Cars - Purchase 38 new single level, 98-passenger or purchase 26 new bi-level, 156-passenger air conditioned, electrically propelled commuter rail cars equipped with radio communications, drinking water and sanitary facilities suitable for interstate operation. Also, including spare parts, supervision of construction, inspection and testing.	\$28,500,000	\$22,800,000	\$5,700,000
"	Support Facilities - Electric Propulsion System - A. Replace six existing 1,500 volt, direct current sub-stations between Michigan City and Hammond, Indiana with 2,000 kilowatt, self-contained outdoor type, silicon rectifiers. Class III and rapid transit rating. B. Install aluminum feeder cable (750 MCM and 500 MCM) Gary to Michigan City, Indiana, 26.88 miles. C. Replace existing substation supervisory system with modern solid-state continuously scanning, audio-tone equipment to control all substations from Kensington (Chicago), Illinois to South Bend, Indiana.	\$2,820,000	\$2,256,000	\$564,000
"	Rolling Stock - Communication Support - Install two-way radio on 22 existing passenger cars to permit communication in C.S.S. & S.B. Railroad radio system and in I.C.G. Railroad commuter division radio system between other passenger trains and train dispatcher. Purchase 10 portable two-way radio units with carrying case and separate battery charging apparatus for head to rear end communications.	\$ 75,000	\$ 60,000	\$ 15,000
"	Rolling Stock - Toilet Facilities - Install retention type toilets on existing passenger cars together with the necessary sewage disposal facility at Shops, Michigan City, Indiana.	\$ 90,000	\$ 72,000	\$ 18,000
East Chicago Transit	Physical Plant Acquisition - Renovate an industrial site owned by the city to provide office, garage, and maintenance facilities for East Chicago Transit.	\$ 150,000	\$ 120,000	\$ 30,000

SECTION 3 CAPITAL PROGRAM (cont'd)

Applicant	Project Description	Total Cost	Federal Share	Local Share
East Chicago Transit	Rolling Stock Additions - Purchase 5 additional 50-passenger, air conditioned diesel coaches.	\$ 325,000	\$ 260,000	\$ 65,000
Consolidated Rail Corp. (PC Service)	Rolling Stock and Motive Power Renewal - A. Replace five 23-year old EMD EBA diesel passenger locomotives equipped for double end operation and with head-end power for train heat, lighting and air conditioning for Chicago-Valparaiso local service. B. Replace fourteen 50-year old heavyweight, 72-seat class P70 coaches with seven double deck, bi-level, 161 seat suburban coaches for the Chicago-Valparaiso service.	\$ 4,150,000	\$ 3,320,000	\$ 830,000
Chicago-Calumet Transit District Corp.	Rolling Stock Replacement - A project to replace existing, worn out buses, according to the manufacturer's recommendation of 12 years as the standard life expectancy of transit buses. (Replace 64 buses).	\$ 4,160,000	\$ 3,328,000	\$ 832,000
TOTAL		\$40,270,000	\$32,216,000	\$8,054,000

Section 5 Capital and Operating Assistance

Funds available - Calendar Year 1976, \$2,020,076

Recipient	Applicants	Project Cost	Project Type	Net Project Cost
Office of the Mayor East Chicago, Ind.	East Chicago Transit	\$ 395,349	Operating Assistance	\$ 790,698
City of Gary	Gary Public Transportation Corp.	\$1,014,705	Operating Assistance	\$2,029,410
Northwestern Indiana Regional Planning Commission and Northwest Indiana Public Transportation Authority	NIRPC/NIPTA Total: NIPTA Total: Carrier: Chicago, South Shore & South Bend RR Chicago & Calumet Transit	\$ 610,022 \$ 20,000	Operating Assistance	\$ 40,000
	Special Service: Metro Corps Gary Neighborhood Services Trade Winds Rehabilitation L.C.E.O.C.	\$ 356,680 \$ 103,338	Operating Assistance Operating Assistance	\$ 713,360 \$ 206,676
		\$ 130,004	Operating Assistance Operating Assistance Operating Assistance	\$ 260,008

Formal project applications will be submitted to the U.S. Department of Transportation, Urban Mass Transportation Administration by the applicant. The City of Gary will compile the Gary PTC project application; the City of East Chicago will compile the East Chicago project application; the NIRPC and NIPTA will jointly compile applications for the South Shore Railroad, the Chicago and Calumet Transit Co., Special Services, and NIPTA. All projects will be for Local Fiscal Year Two, January 1, 1976 to December 31, 1976. The Annual Element will be revised in January, 1977 to reflect programmed projects for the period January 1, 1977 to December 31, 1977.

APPENDIX F

STATE WATER QUALITY STANDARDS
APPLICABLE TO NORTHWEST INDIANA

REGULATION SPC IR-3

WATER QUALITY STANDARDS
FOR WATERS OF INDIANA

EFFECTIVE

August 21, 1973

INDIANA STREAM POLLUTION CONTROL BOARD

STATE OF INDIANA
STREAM POLLUTION CONTROL BOARD REGULATION

SPC 1R-3

Subsequent to due publication of notice and public hearings having been held on May 8, 1973, and May 17, 1973, as required by the provisions of IC 1971, 4-22-2, as originally enacted in the Acts of 1945, Chapter 120, the Indiana Stream Pollution Control Board, at its regular meeting held at the Indiana State Board of Health Building, 1330 West Michigan Street, Indianapolis, Indiana, on July 17, 1973, at which meeting a quorum was present, unanimously adopted the following new rule SPC 1R-3 which amends in its entirety SPC 1R-2 heretofore adopted on September 18, 1970, and further resolved that upon promulgation of SPC 1R-3, Regulation SPC 9 is repealed.

SPC 1R-3

A REGULATION establishing water quality standards for all waters of the State of Indiana except those waters specifically named in any other valid rule or regulation of the Stream Pollution Control Board pursuant to the authority granted in IC 1971, 13-1-3 and IC 1971, 13-7, amending in its entirety SPC 1R-2 promulgated on September 18, 1970, and repealing SPC 9 promulgated on June 13, 1967.

Section 1. (Nondegradation of Existing High Quality Waters) All waters whose existing quality is better than the following criteria as of the date on which this regulation becomes effective will be maintained in their present high quality. Such waters will not be lowered in quality unless and until that such change is justifiable as a result of necessary economic or social development and will not become injurious to any assigned uses made of, or presently possible, in such waters.

Section 2. (Waters Designations) This Regulation shall apply to all waters of the State except Lake Michigan, Wolf Lake, the Grand Calumet River, the Indiana Harbor Ship Canal and privately-owned ponds.

Section 3. (Water Use Designations)

(a) The following uses have been established by the Stream Pollution Control Board for all waters of the State except as provided in Section 2 above:

- (1) All lakes and reservoirs, the St. Joseph River in Elkhart and St. Joseph Counties, the St. Joseph River in Allen County, the Wabash River where forming the common boundary with Illinois, the lower reaches of the Indiana portion of the Whitewater River and the Ohio River will be maintained for whole body contact recreation. All other streams will be maintained for partial body contact recreation.
- (2) All waters will be capable of supporting a well-balanced, warm water fish population; except that, all waters, where the natural temperatures will permit, will be capable of supporting put-and-take trout fishing; and where now possible, the natural reproduction of trout and salmon.
- (3) All waters which are used for public or industrial water supply must meet the criteria for these uses at the points where the water is withdrawn.

- (4) All waters which are used for agricultural purposes must meet the criteria established in subsection 6(a).
- (b) Where multiple uses have been designated for a body of water, the most protective of all simultaneously applicable criteria will apply.

Section 4. (Mixing Zones)

- (a) All water quality criteria in this Regulation except those provided in subsection 6(a) below, are to be applied at a point outside of the mixing zone to allow for a reasonable admixture of waste effluents with the receiving waters.
- (b) Due to varying physical, chemical and biological conditions, no absolute mixing zone may be prescribed. Where possible (sub-section 4(c)) the general guideline is to be that the mixing zone should be limited to no more than $1/4$ (25%) of the cross-sectional area and/or volume of flow of the stream, leaving at least $3/4$ (75%) free as a zone of passage for aquatic biota nor should it extend over $1/2$ (50%) of the width of the stream.
- (c) The applicability of the guideline (subsection 4(b)) will be on a case-by-case basis and the following factors must be considered:
 - (1) The dilution ratio,
 - (2) The physical, chemical, and biological characteristics of the receiving body of water,
 - (3) The physical, chemical, and biological characteristics of the waste effluent,
 - (4) The present and anticipated uses of the receiving body of water,
 - (5) The measured or anticipated effect of the discharge on the quality of the receiving body of water and
 - (6) The synergistic effects of overlapping mixing zones or the aggregate effects of adjacent mixing zones.

(d) In any event, the total area and/or volume of the receiving stream, lake or reservoir assigned to mixing zones will be limited to:

- (1) A short stretch of the stream or small area of the lake or reservoir or
- (2) That distance, area and/or volume necessary to reasonably meet the purposes of the mixing zone.

Section 5. All stream quality criteria in this Regulation, except those provided in subsection 6(a) below, will apply at all times when the stream flows are equal to or greater than the average minimum seven-consecutive-day low flow which occurs once in ten years.

Section 6. (Water Quality Criteria)

- (a) All waters at all times and at all places, including the mixing zone, shall meet the minimum conditions of being free from substances, materials, floating debris, oil or sum attributable to municipal, industrial, agricultural or other discharges:
 - (1) That will settle to form putrescent or otherwise objectionable deposits,
 - (2) That are in amounts sufficient to be unsightly or deleterious,
 - (3) That produce color, odor or other conditions in such degree as to create a nuisance,
 - (4) Which are toxic or harmful to human, animal, plant or aquatic life and
 - (5) Which are in concentrations or combinations that will cause or contribute to the growth of aquatic plants or algae in such a degree as to create a nuisance, be unsightly or deleterious or be harmful to human, animal, plant or aquatic life or otherwise impair the designated uses.
- (b) In addition to subsection 6(a) above and pursuant to subsection 3(a) (2), the following criteria are for the evaluation of conditions for the maintenance of a well-balanced fish population. They are applicable at any point in the waters outside of the mixing zone:

- (1) (pH) No pH values below 6.0 nor above 8.5, except daily fluctuations which exceed pH 8.5 and are correlated with photosynthetic activity, may be tolerated. However, any sudden drop below pH 6.0 or sudden rise above pH 8.5, not related to photosynthesis, indicates abnormal conditions which should be investigated immediately.
 - (2) (Taste and Odor) There shall be no substances which impart unpalatable flavor to food fish or result in noticeable offensive odors in the vicinity of the water.
 - (3) (Toxic Substances) Concentrations of toxic substances shall not exceed one-tenth of the 96-hour median tolerance limit for important indigenous species, except that other more stringent application factors shall be used when justified on the basis of available evidence and approved by the appropriate agency.
- (c) In addition to subsection 6(a) and 6(b) above and pursuant to 3(a)(2), the following criteria are for the evaluation of conditions for the maintenance of a well-balanced, warm water fish population. They are applicable at any point in the waters outside of the mixing zone:
- (1) (Dissolved Oxygen) Concentrations of dissolved oxygen shall average at least 5.0 mg/l per calendar day and shall not be less than 4.0 mg/l at any time.
 - (2) (Temperature)
 - (aa) There shall be no abnormal temperature changes that may affect aquatic life unless caused by natural conditions.
 - (bb) The normal daily and seasonal temperature fluctuations that existed before the addition of heat due to other than natural causes shall be maintained.
 - (cc) The maximum temperature rise at any time or place above natural temperatures shall not exceed 5°F. in streams and 3°F. in lakes and reservoirs.

- (dd) In addition, the water temperature of of streams shall not exceed the maximum limits indicated in the following table:

	<u>Ohio River Main Stem</u>	<u>St. Joseph River Tributary to Lake Michigan</u>	<u>Other Indiana Streams</u>
January	50	50	50
February	50	50	50
March	60	55	60
April	70	65	70
May	80	75	80
June	87	85	90
July	89	85	90
August	89	85	90
September	87	85	90
October	78	70	78
November	70	60	70
December	57	50	57

- (d) In addition to subsection 6(a) and 6(b) above and pursuant to 3(a)(2), the following criteria are for the evaluation of conditions for the maintenance of a well-balanced, cold water fish population. They are applicable at any point in the waters outside of the mixing zone:

(1) (Dissolved Oxygen)

- (aa) In those waters designated for put-and-take trout fishing, dissolved oxygen concentrations shall not be less than 6.0 mg/l at any time or place.
- (bb) Spawning areas (during the spawning season) shall be protected by a minimum dissolved oxygen concentration of 7.0 mg/l.

(2) (Temperature)

- (aa) In lakes and streams, where the natural reproduction of trout and salmon is to be protected, no heat shall be added.
- (bb) In put-and-take streams, temperatures shall not exceed 65 F. or a 5° F. rise above natural, whichever is less.
- (cc) In lakes where a put-and-take trout fishery is to be protected, no heat shall be added.

- (c) In addition to subsection 6(a) above and pursuant to subsection 3(a) (1), the criterion for the evaluation of conditions for maintaining whole body contact recreation at any point in the waters outside of the mixing zone is that the fecal coliform bacteria content (either MPN or MF count) shall not exceed 200 per 100 ml as a geometric mean based on not less than five samples; nor exceed 400 per 100 ml in more than one sample during the month. The months of April through October, inclusive, are designated as the recreational season.
- (f) In addition to subsection 6(a) above and pursuant to subsection 3(a)(1), the criterion for the evaluation of conditions for maintaining partial body contact recreation at any point in the waters outside of the mixing zone is that the fecal coliform bacteria content (either MPN or MF count) shall not exceed 1,000 per 100 ml as a geometric mean based on not less than five samples; nor exceed 2,000 per 100 ml in more than one sample.
- (g) In addition to subsection 6(a) above and pursuant to subsection 3(a)(3), the following criteria are for the evaluation of the water quality at the point at which water is withdrawn for treatment and distribution as a potable supply:
- (1) (Bacteria) The coliform bacteria group shall not exceed 5,000 per 100 ml as a monthly average value (either MPN or MF count); nor exceed 20,000 per 100 ml in more than five percent of such samples.
 - (2) (Threshold-odor number) Taste and odor producing substances, other than naturally occurring, shall not interfere with the production of a finished water by conventional treatment consisting of coagulation, sedimentation, filtration and chlorination. The threshold odor number of the finished water must be three or less.
 - (3) (Dissolved Solids) Other than from naturally occurring sources, dissolved solids shall not exceed 500 mg/l as a monthly average value, nor exceed 750 mg/l at any time. Values of specific conductance of 800 and 1,200 micromhos/cm (at 25°C) may be considered equivalent to dissolved solids concentrations of 500 and 750 mg/l.

- (4) (Radioactive substances) Water supplies shall be approved without further consideration of other sources of radioactivity intake of Radium-226 and Strontium-90 when the water contains these substances in amounts not exceeding 3 and 10 picocuries per liter, respectively. In the known absence of Strontium-90 and alpha emitters, the water supply is acceptable when the gross beta concentrations do not exceed 1,000 picocuries per liter.
- (5) (Chemical Constituents) The chemical constituents in the waters shall not be present in such levels as to prevent meeting the Drinking Water Standards adopted by the Indiana State Board of Health after conventional water treatment.
- (h) In addition to subsection 6(a) and pursuant to subsection 3(a)(3), the criterion for the evaluation of water quality at the point at which water is withdrawn for use (either with or without treatment) for industrial cooling and processing is that, other than from naturally occurring sources, the dissolved solids shall not exceed 750 mg/l as a monthly average, nor exceed 1,000 mg/l at any time. Values of specific conductance of 1,200 and 1,600 micromhos/cm (at 25°C) may be considered equivalent to dissolved solids concentrations of 750 and 1,000 mg/l.
- (i) Pursuant to subsection 3(a)(4), the criteria for evaluation of conditions for agricultural use are the same as those in subsection 6(a).

Section 7. (Wastewater Treatment Requirements)

- (a) All municipal and semi-public wastewaters shall be subject to the following wastewater treatment requirements prior to the discharge to the waters of the State:
 - (1) (Secondary Treatment) All sewage and other wastewater containing comparable amounts of organic material shall receive a minimum of secondary treatment.

(2) (Advanced Treatment) Treatment in excess of that which can be provided by secondary wastewater treatment facilities shall be required when the seven-consecutive-day low flow occurring once in ten years in the receiving stream is less than three times the flow of wastewater being discharged thereto or when otherwise necessary to insure that established water quality criteria are met.

(3) (Phosphorus Removal)

(aa) Phosphorus removal or control facilities shall be required at all municipalities and semi-public facilities with a daily discharge of elemental phosphorus (P) of ten (10) pounds or greater when:

(i) They are located within the Lake Michigan or Lake Erie Basins, or

(ii) They discharge directly to a lake or reservoir or to a tributary at a point within 40 miles upstream from a lake or reservoir.

(bb) Phosphorus removal or control facilities shall be required at any municipality or semi-public facility, regardless of the quantitative elemental phosphorus content in its daily discharge, when it is determined that phosphorus reduction is required to protect downstream water uses or necessary to insure that established water quality criteria are met.

(cc) Where required, phosphorus removal facilities shall be designed to achieve an 80 percent reduction in the elemental phosphorus (P) content of the wastewater or produce an effluent containing no more than 1.0 mg/l of elemental phosphorus (P), whichever is more stringent.

(4) (Effluent Disinfection) All sewage treatment plant effluents and other wastewaters which may cause or contribute to the bacterial contamination of the receiving waters shall be adequately disinfected prior to discharge to waters of the State. Disinfection shall be on a continuous basis and shall be to such extent that the coliform bacterial criteria for the designated recreational and/or public water supply use are met in the receiving water outside of the mixing zone.

(b) All industrial and any other point source wastewater discharges, other than those specified in subsection 7(a) above, shall be subject to the following wastewater treatment requirements prior to discharge to waters of the State:

- (1) All said wastewaters which contain organic material and/or suspended solids shall receive treatment which will produce an effluent of equal quality to that required to be produced by municipal and semi-public sewage treatment plants in the same stream reach.
- (2) All said wastewaters which contain contaminants of any kind other than those specified in subsection 7(b)(1) shall provide the best practicable degree of wastewater treatment or control consistent with technological feasibility, economic reasonableness and sound engineering judgement.

(3) (Phosphorus Removal)

(aa) Phosphorus removal or control facilities shall be required for all said wastewaters with a daily discharge of elemental phosphorus (P) of ten (10) pounds or greater when:

(i) They are located within the Lake Michigan or Lake Erie Basins, or

(ii) They discharge directly to a lake or reservoir or to a tributary at a point within 40 miles upstream from a lake or reservoir.

(bb) Phosphorus removal or control facilities shall be required at any industry or any other point source discharge, regardless of the quantitative elemental phosphorus content in its daily discharge, when it is determined that phosphorus reduction is required to protect downstream water uses or necessary to insure that established water quality criteria are met.

(cc) Where required, phosphorus removal facilities shall be designed to achieve an 80 percent reduction in the elemental phosphorus (P) content of the wastewater or produce an effluent containing no more than 1.0 mg/l of elemental phosphorus (P), whichever is more stringent

Section 8. The analytical procedures uses as methods of analyses to determine the chemical, bacteriological, biological, and radiological quality of waters sampled shall be in accordance with the latest edition of Standard Methods for the Examination of Water and Wastewater or other methods approved by the Indiana Stream Pollution Control Board and the Environmental Protection Agency, Water Quality Office.

Section 9. Unless otherwise specified, the term average as used herein means an arithmetical average.

Section 10. If any section, paragraph, sentence, clause, phrase, or word of this regulation, or any other part thereof, be declared unconstitutional or invalid for any reason, the remainder of said regulation shall not be affected thereby and shall remain in full force and effect.

Section 11. This regulation shall, upon promulgation, repeal Regulation SPC 9 which covered the Little Calumet River flowing into Illinois promulgated June 13, 1967.

REGULATION SPC 7R-2

WATER QUALITY STANDARDS
FOR THE GRAND CALUMET RIVER AND
THE INDIANA HARBOR SHIP CANAL

EFFECTIVE

August 21, 1973

INDIANA STREAM POLLUTION CONTROL BOARD

STATE OF INDIANA
STREAM POLLUTION CONTROL BOARD REGULATION

SPC 7R-2

Subsequent to due publication of notice and public hearing having been held on May 17, 1973, as required by the provisions of IC 1971, 4-22-2, as originally enacted in the Acts of 1945, Chapter 120, the Indiana Stream Pollution Control Board, at its regular meeting held at the Indiana State Board of Health Building, 1330 West Michigan Street, Indianapolis, Indiana, on July 17, 1973, at which meeting a quorum was present, unanimously adopted the following new rule SPC 7R-2 which amends in its entirety SPC 7R heretofore adopted on February 11, 1972.

A REGULATION establishing the water quality standards for the Grand Calumet River and the Indiana Harbor Ship Canal pursuant to the authority granted in IC 1971, 13-1-3 and IC 1971, 13-7 and amending in its entirety SPC 7R promulgated on February 11, 1972.

Section 1. The Indiana Stream Pollution Control Board recognizes that a major function of the Grand Calumet River and the Indiana Harbor Ship Canal is the conveyance of treated wastewater and storm water overflow and that essentially the entire flow in these streams is made up of such waters. The Board further recognizes that even if all wastewaters discharged to these streams are provided the highest degree of treatment possible, criteria for maintaining a well-balanced, warm water fish population may not be met at all times. Therefore, the Board classifies these waters for partial body contact, industrial water supply and limited aquatic life.

Section 2. (Water Quality Criteria)

- (a) All waters at all times and at all places, including the mixing zone, shall meet the minimum conditions of being free from substances, materials, floating debris, oil or scum attributable to municipal, industrial, agricultural or other discharges:
 - (1) That will settle to form putrescent or otherwise objectionable deposits,
 - (2) That are in amounts sufficient to be unsightly or deleterious,
 - (3) That produce color, odor or other conditions in such degree as to create a nuisance,

- (4) Which are toxic or harmful to human, animal, plant or aquatic life and
 - (5) Which are in concentrations or combinations that will cause or contribute to the growth of aquatic plants or algae in such degree as to create a nuisance, be unsightly or deleterious or be harmful to human, animal, plant or aquatic life or otherwise impair the designated uses.
- (b) In addition to subsection 2(a) above, the following criteria are for evaluation of waters of the Grand Calumet River and the Indiana Harbor Ship Canal. They are applicable at any point in the stream except for areas immediately adjacent to outfalls. In such areas cognizance will be given to the opportunities for the admixture of waste effluents with the receiving water:
- (1) (Dissolved Oxygen) Concentrations of dissolved oxygen shall average at least 3.0 mg/l during any 24-hour period and shall not be less than 2.0 mg/l at any time.
 - (2) (pH) No pH values below 6.5 or above 8.5, except daily fluctuations which exceed 8.5 and are related to photosynthetic activity, may be tolerated.
 - (3) (Temperature) The water temperature shall not exceed 90 degrees Fahrenheit during the period from October through and including March.
 - (4) (Fecal Coliform Bacteria) The fecal coliform bacteria content (either MPN or MF count) shall not exceed a geometric mean of 1,000 per 100 ml, nor exceed 2,000 per 100 ml in more than ten percent of the samples, except during periods of storm water runoff.
 - (5) (Filterable Residue (total dissolved solids)) The filterable residue content shall not average more than 275 mg/l during any 24-hour period nor exceed this value at any time, except in waters flowing westward into Illinois, the concentrations shall not exceed 500 mg/l.
 - (6) (Chemical Constituents) The following levels of chemical constituents shall not be exceeded at any time:

(6) (Chemical Constituents) Continued

<u>Constituent</u>	<u>Concentration (mg/l)</u>
Ammonia Nitrogen	1.5
*Chloride	35.0
Cyanide	0.1
Fluoride	1.3
Iron (dissolved)	0.3
Mercury (total)	0.005
Phenol-like substances	0.010
Sulfates	75.0

*In waters flowing westward into Illinois,
the concentration shall not exceed 125 mg/l.

- (7) (Toxic Substances) Concentrations of toxic substances shall not exceed one-tenth of the 96-hour median tolerance limit for important indigenous species, except that other more stringent application factors shall be used when justified on the basis of available evidence and approved by the appropriate regulatory agencies.
- (8) (Total Phosphorus) The content of total phosphorus shall not exceed 0.10 mg/l at any time except in water flowing westward into Illinois.
- (9) (Biochemical Oxygen Demand) The biochemical oxygen demand shall not exceed 10.0 mg/l.
- (10) (Oil) Oil or similar materials shall not be present in such quantities that they will produce a visible film on the water surface, coat the banks and bottom of the stream or in any way be toxic or harmful to fish or other aquatic life. In addition, the total oil concentration, determined by the petroleum ether extraction method, shall not exceed 5.0 mg/l.
- (11) (Miscellaneous Trace Contaminants and Radionuclides) Miscellaneous trace contaminants and radionuclides shall not be present in concentrations that will prevent meeting Public Health Service 1962 Drinking Water Standards after conventional treatment.

Section 3. Unless otherwise specified, the term average as used herein means an arithmetical average.

Section 4. The analytical procedures used as methods of analyses to determine the chemical, bacteriological, biological, and radiological quality of waters sampled shall be in accordance with the latest edition of Standard Methods for the Examination of Water and Wastewater or other methods approved by the Indiana Stream Pollution Control Board and the Federal Environmental Protection Agency.

Section 5. If any section, paragraph, sentence, clause, phrase, or word of this regulation, or any other part thereof, be declared unconstitutional or invalid for any reason, the remainder of said regulation shall not be affected thereby and shall remain in full force and effect.

REGULATION SPC 10R

WATER QUALITY STANDARDS
FOR WOLF LAKE

EFFECTIVE
August 21, 1973

INDIANA STREAM POLLUTION CONTROL BOARD

STATE OF INDIANA
STREAM POLLUTION CONTROL BOARD REGULATION

SPC 10R

Subsequent to due publication of notice of public hearing having been held on May 17, 1973, as required by the provisions of IC 1971, 4-22-2, as originally enacted in the Acts of 1945, Chapter 120, the Indiana Stream Pollution Control Board at its regular meeting held at the Indiana State Board of Health Building, 1330 West Michigan Street, Indianapolis, Indiana, on July 17, 1973, at which meeting a quorum was present, unanimously adopted the following new rule SPC 10R which amends in its entirety SPC 10 heretofore adopted on June 13, 1967.

A REGULATION establishing the water quality standards for Wolf Lake and the Wolf Lake Channel pursuant to the authority granted in IC 1971, 13-1-3 and IC 1971, 13-7 and amending in its entirety SPC 10 promulgated on June 13, 1967.

Section 1. (Water Use Designations)

- (a) The following uses have been established by the Indiana Stream Pollution Control Board for the waters of Wolf Lake Proper and Wolf Lake Channel:
 - (1) All waters of Wolf Lake Proper will be maintained for whole body contact recreation.
 - (2) All waters of Wolf Lake Channel will be maintained for partial body contact recreation.
 - (3) All waters of both Wolf Lake Proper and Wolf Lake Channel will be capable of supporting a well-balanced, warm water fish population.

Section 2. (Water Quality Criteria)

- (a) All waters at all times and at all places, including the mixing zone, shall meet the minimum conditions of being free from substances, materials, floating debris, oil or scum attributable to municipal, industrial, agricultural or other discharges:
 - (1) That will settle to form putrescent or other objectionable deposits,
 - (2) That are in amounts sufficient to be unsightly or deleterious,
 - (3) That produce color, odor or other conditions in such degree as to create a nuisance,

- (4) Which are toxic or harmful to human, animal, plant or aquatic life and
 - (5) Which are in concentrations or combinations that will cause or contribute to the growth of aquatic plants or algae in such degree as to create a nuisance, be unsightly or deleterious or be harmful to human, animal, plant or aquatic life or otherwise impair the designated uses.
- (b) In addition to subsection 2(a) above, the following criteria are for evaluation of waters of Wolf Lake and Wolf Lake Channel. They are applicable at any point in these waters except for areas immediately adjacent to outfalls. In such areas, cognizance will be given to the opportunities for the admixture of waste effluents with the receiving water:
- (1) (Fecal Coliform Bacteria)
 - (aa) The fecal coliform content (either MPN or MF count) in Wolf Lake Proper shall not exceed 200 per 100 ml as a geometric mean based on not less than five samples; nor exceed 400 per 100 ml in more than ten percent of the samples.
 - (bb) The fecal coliform content (either MPN or MF count) at all locations in Wolf Lake Channel shall not exceed a geometric mean of 1,000 per 100 ml, nor exceed 2,000 per 100 ml in more than ten percent of the samples.
 - (2) (Dissolved Oxygen) Concentrations of dissolved oxygen shall average at least 5.0 mg/l per calendar day and shall not be less than 4.0 mg/l at any time, except that lower values associated with depth may be tolerated where caused by natural conditions.
 - (3) (pH) No pH values below 6.5 nor above 8.5, except daily fluctuations which exceed pH 8.5 and are correlated with photosynthetic activity, may be tolerated

- (4) (Toxic Substances) Concentrations of toxic substances shall not exceed one-tenth of the 96-hour median tolerance limit for important indigenous species, except that other more stringent application factors shall be used when justified on the basis of available evidence and approved by the appropriate regulatory agencies.
 - (5) (Oil) Oil or similar materials shall not be present in such quantities that they will produce a visible film on the water surface, coat the banks and bottom of the Lake or in any way be toxic or harmful to fish or other aquatic life.
 - (6) (Ammonia Nitrogen (N)) Any single daily value of ammonia nitrogen shall not be more than 0.12 mg/l.
 - (7) (Cyanides (CN)) Any single daily value of cyanide shall not be more than 0.025 mg/l.
 - (8) (Total Phosphorus (P)) Any single daily value of total phosphorus shall not be more than 0.04 mg/l.
 - (9) (True Color) Any single daily value of true color shall not be more than 15 units.
 - (10) (Odor) No obnoxious odor of other than natural origin shall be present.
 - (11) (Turbidity) No activity causing turbidity, of other than natural origin, that will cause substantial visible contrast with the natural appearance of the water shall be permitted.
- (c) In addition to subsections 2(a) and 2(b) above, the following temperature criteria are for the evaluation of waters of Wolf Lake and Wolf Lake Channel. All temperatures are expressed in degrees Fahrenheit. The point of measurement shall normally be in the surface one meter at such depth as to avoid thin layer surface warming due to extreme ambient air temperatures; but where required to determine the true distribution of heated wastes and natural variations in water temperature, measurements shall be made at greater depths and at several depths so as to form a thermal profile. Surface water drains and combined sewer overflows are exempted from the following:

- (1) There shall be no abnormal temperature changes in the waters of Wolf Lake so as to be injurious to fish, wildlife, or other aquatic life or the growth or propagation thereof.
- (2) The normal daily and seasonal temperature fluctuations for waters of Wolf Lake that existed before the addition of heat shall be maintained.
- (3) The temperature of the waters of Wolf Lake shall not exceed 85 degrees Fahrenheit during the summer or 60 degrees Fahrenheit during the period from October through and including March.
- (4) At any time and at any place in Wolf Lake Channel after mixing, the receiving water shall not be more than five degrees Fahrenheit above the existing natural water temperature of the Lake. In addition the temperature of Wolf Lake Channel at its mouth shall not be more than three degrees Fahrenheit above the natural temperature of the Lake.

Section 3. Unless otherwise specified, the term average as used herein means an arithmetical average.

Section 4. The analytical procedures used as methods of analyses to determine the chemical, bacteriological, biological, and radiological quality of waters sampled shall be in accordance with the latest edition of Standard Methods for the Examination of Water and Wastewater or other methods approved by the Indiana Stream Pollution Control Board and the Federal Environmental Protection Agency.

Section 5. If any section, paragraph, sentence, clause, phrase, or word of this regulation, or any other part thereof, be declared unconstitutional or invalid for any reason, the remainder of said regulation shall not be affected thereby and shall remain in full force and effect.

REGULATION SPC 12

NATURAL SPAWNING AREAS, REAPING OR IMPRINTING
AREAS AND MIGRATION ROUTES OF SALMONID FISHES

EFFECTIVE
February 11, 1972

INDIANA STREAM POLLUTION CONTROL BOARD

STATE OF INDIANA
STREAM POLLUTION CONTROL BOARD

REGULATION SPC 12

A. Natural Spawning and Rearing or Imprinting Areas

The criteria listed below are for evaluation of the following waters designated by the Indiana Department of Natural Resources as natural spawning areas or rearing or imprinting areas for salmonid fishes:

Rearing or Imprinting Areas

Trail Creek from Black Road on the West Branch and
Meer Road on the East Branch downstream to Highway 35.
Little Calumet River and tributaries joining it
from the southern boundary of the Westville Prison
Farm downstream to the Wagner Road Bridge near
Chesterton.
Black Ditch from Beverly Drive downstream to Lake
Michigan.
Salt Creek above its confluence with the Little
Calumet River.

1. Dissolved Oxygen: Concentrations shall not be less than 6.0 mg/l at any time or any place. During the spawning season or during periods of rearing or imprinting, the dissolved oxygen shall not fall below 7.0 mg/l at any time or any place.
2. Temperature: No heat shall be added.
3. Taste and Odor: There shall be no substances which impart unpalatable flavor to fish or taint any of the associated biota; or result in an offensive or unnatural odor of the water or in the vicinity of the water.
4. pH: No values below 6.0 or above 8.5, except daily fluctuations which exceed pH 8.5 and are correlated with photosynthetic activity, may be tolerated. However, any drop below 6.0 or sudden rise above 8.5 not related to photosynthesis indicates abnormal conditions.
5. Oil: Oil or similar materials shall not be present in such quantities that they will produce a visible film on the water surface, coat the banks and bottom of the stream, or in any way be toxic or harmful to fish or other aquatic life.

6. Turbidity: No material from other than natural causes shall be added which will cause the turbidity of the water to exceed 10 Jackson turbidity units (JTU).
7. Settleable Solids: No settleable material from other than natural causes shall be added in quantities that will adversely affect salmonid fishes or the natural biota.
8. Color: No material from other than natural causes shall be added which will produce a noticeable change from the natural color or clarity of the water.
9. Floating Materials: Free from floating debris, scum, and other floating materials in amounts sufficient to be unsightly or deleterious.
10. Radioactive Materials: The gross beta concentration shall not exceed 100 picocuries per liter (pc/l). In addition, the concentrations of Radium-226 and Strontium-90 shall not exceed 1 and 2 picocuries per liter, respectively.
11. Toxic Substances: Not to exceed one-tenth of the 96-hour median tolerance limit of salmonid fishes or the natural biota obtained from continuous flow bioassays where the dilution water and toxicant are continuously renewed, except that other lower application factors may be used in specific cases when justified on the basis of available evidence.
12. Fecal Coliform Bacteria: The fecal coliform bacteria content (either MPN or MF count) shall not exceed a geometric mean of 1,000 per 100 ml, nor exceed 2,000 per 100 ml in more than ten percent of the samples.
13. Plant Nutrients: Free from substances attributable to municipal, industrial, agricultural or other sources in concentrations or combinations which will cause or contribute to the growth of aquatic plants or algae in such degree as to create a nuisance, be unsightly or deleterious, or be harmful to salmonid fishes or the natural biota.
14. Mercury (Total): The total mercury concentration shall not exceed 0.005 milligrams per liter (mg/l) at any time or place.

B. Migration Routes

The criteria listed below are for evaluation of the following streams used by salmonid fishes to migrate to and from natural spawning or rearing or imprinting areas. In addition, any criteria that applies to spawning, rearing or imprinting areas will also apply to migration routes unless new numerical limits for said criteria are listed below. In those waters within migration routes where put-and-take trout fishing exists, the requirements of SPC 1R-2 shall apply:

Existing Migration Routes

Trail Creek from Highway 35 downstream to Lake Michigan.

Little Calumet River from Wagner Road Bridge downstream to Lake Michigan via Burns Ditch.

1. Dissolved Oxygen: Concentrations shall average at least 6.0 mg/l during any 24-hour period and shall not be less than 5.0 mg/l at any time. During periods of migration, the dissolved oxygen shall not fall below 6.0 mg/l at any time or any place.
2. Temperature:
 - a. The normal daily and seasonal temperature fluctuations that existed before the addition of heat due to other than natural causes shall be maintained.
 - b. The maximum temperature rise at any time or place above natural shall not exceed 2 degrees Fahrenheit. In addition, the temperature shall not exceed 70 degrees Fahrenheit at any time or place during periods of migration nor exceed 85 degrees Fahrenheit at any time.
3. Turbidity: No material from other than natural causes shall be added which will cause the turbidity of the water to exceed 25 Jackson turbidity units.
4. Settleable Solids: Free from substances that will settle to form putrescent or otherwise objectionable deposits.
5. Color: Free from materials producing color or other conditions that will create a nuisance or interfere with the normal migration of salmonid fishes.

NOTE 1: Unless otherwise specified, the term average as used herein means an arithmetical average.

NOTE 2: The analytical procedures used as methods of analyses to determine the chemical, bacteriological, biological and radiological quality of water sampled shall be in accordance with the latest edition of Standard Methods for the Examination of Water and Wastewater or other methods approved by the Indiana Stream Pollution Control Board and the Federal Environmental Protection Agency.

APPENDIX G

INLAND STEEL N.P.D.E.S. OPERATING REPORT

PERMIT NO. 6000094

COL
OUT FALL NO.

A-108

OUT FALL NO.

MONTH MONITORED	FLOW	PH	OIL	SS	THENOL	CN	AMONIA
	MGD		MG/L	MG/L	MG/L	MG/L	MG/L
7/75		8.5	0	21	.114	.19	1.0
WASTE LOAD MAXIMUM				6	.010	.01	0
WASTE LOAD MINIMUM		7.7	0	12	.032	.03	0.4
WASTE LOAD AVERAGE	195.2						
NPDES SPECS.							
TYPE	CONT.	GR.	GR.	24	24	24	24
FREQ.	1/31	2/7	7/7	7/7	7/7	7/7	7/7
COND. MEAN/MAX.		6.0/9.0	2.0/10.0	35/70			

SOURCE: INLAND STEEL COMPANY

PERMIT NO. 0000044

003

OUT FALL NO.

MONTH MONITORED	FLOW	PH	OIL	SS	Fe	Zn	Ce												
7/75	MGD		MGL	MGL	MGL	MGL	MGL												
WASTE LOAD MAXIMUM		8.5	7	40	5.5	.31	0												
WASTE LOAD MINIMUM		8.3	0	5	0.2	0	0												
WASTE LOAD AVERAGE	4.21		0.6	17	2.3	0.07	0												
NPDES SPECS.																			
TYPE	CONT.	GR	GR	24	24	24	24												
FREQ.	1/31	7/7	7/7	7/7	7/7	7/7	7/7												
COND. MEAN/MAX.		6.0/8.0	10/20	25/70		100/103													

002

OUT FALL NO.

A-111

MONTH MONITORED	FLOW	pH	OIL	SS	PHENOL	CN	AMMONIA													
7/75	MGD		MG/L	MG/L	MG/L	MG/L	MG/L													
WASTE LOAD MAXIMUM		8.3	0	24	.024	.56	0.4													
WASTE LOAD MINIMUM		7.5	0	3	.003	.02	.6													
WASTE LOAD AVERAGE	21.6		0	10	.008	.16	0.2													
NPDES SPECS.																				
TYPE	CONT.	24	GR	24	24	24	24													
FREQ.	1/31	7/7	7/7	7/7	7/7	7/7	7/7													
COND. MEAN/MAX.			5/10	30/60	15.5/46.0	5.4/22.15	130/10770													

11

OUT FALL NO.

A-113

SOURCE: INLAND STEEL COMPANYPERMIT NO. 0000094

012

OUT FALL NO.

MONTH MONITORED	FLOW	PH	OIL MG/L	SS MG/L	PHENOL MG/L	COD MG/L	AMMONIA MG/L
7/75	MGD						
WASTE LOAD MAXIMUM		8.5	0	15	.04	.01	.4
WASTE LOAD MINIMUM		7.7	0	2	.006	.01	0
WASTE LOAD AVERAGE	17.28		0	6	.015	.01	.1
NPDES SPECS.							
TYPE	CONT.	GR	GR	24	24	24	24
FREQ.	7/7	2/8	7/7	7/7	7/7	7/7	7/7
COND. MEAN/MAX.		6.0/ 9.0	2.0/ 11.0		755/ 866	549/ 2915	1300/ 10,770

SOURCE: INLAND STEEL COMPANY

PERMIT NO. 0000094

OUT FALL NO. 013

MONTH MONITORED	FLOW	PH	OIL	SS	PHENOL	CN	AMONIA	FE											
7/75	MGD		MG/L	MG/L	MG/L	MG/L	MG/L	MG/L											
WASTE LOAD MAXIMUM		8.4	11	39	.118	.11	1.4	5.0											
WASTE LOAD MINIMUM		7.1	6	16	.010	.01	0.3	1.1											
WASTE LOAD AVERAGE	124.6		1.3	7	.032	.04	0.9	2.4											
NPDES SPECS.																			
TYPE	CONT.	GR	GR	24	24	24	24	24											
FREQ.	7/7	7/7	7/7	7/7	7/7	7/7	7/7	7/7											
COND. MEAN/MAX.		6.9 9.0	5.0 10.0	35 70	75.5 866	549 2375	130 10770	5/10											

SOURCE: INLAND STEEL

PERMIT NO. 0000094

014

OUT FALL NO.

MONTH MONITORED	FLOW	PH	OIL	SS	PHENOL	CN	ANOKIA	Fe											
7/75	MGD		MG/L	MG/L	MG/L	MG/L	MG/L	MG/L											
WASTE LOAD MAXIMUM		8.4	13	30	.132	.11	1.4	6.0											
WASTE LOAD MINIMUM		7.7		7	.006	.01	0.7	1.0											
WASTE LOAD AVERAGE	124.6		1.6	13	.036	.05	1.0	2.0											
NPDES SPECS.																			
TYPE	CONT.	GR	GR	24	24	24	24	24											
FREQ.	7/7	7/7	7/7	7/7	7/7	7/7	7/7	7/7											
COND. MEAN/MAX.		6.9/9.0	5.0/10.0	136/70	16.5/866	549/2315	1332/10770	5.0/10.0											

OUT FALL NO.

MONTH MONITORED	FLOW	PH	OIL	SS
7/75	MGD		MGL	MGL
WASTE LOAD MAXIMUM			26	16
WASTE LOAD MINIMUM			0	7
WASTE LOAD AVERAGE		8.5	6	10
NPDES SPECS.				
TYPE	CONT.	GR	GR	24
FREQ.	7/7	2/8	7/7	7/7
COND. MEAN/MAX.		60/9.0	4.9/10.6	15.9/30.0

PERMIT NO. 000094 017

OUT FALL NO.

MONTH MONITORED	FLOW	PH	OIL	SS
7/25	MGD		MG/L	MG/L
WASTE LOAD MAXIMUM		8.6	7	33
WASTE LOAD MINIMUM		7.8		4
WASTE LOAD AVERAGE	169.6		0.2	13
NPDES SPECS.				
TYPE	CONT.	GR	GR	24
FREQ.	7/7	2/8	7/7	7/7
COND. MEAN/MAX.		6P/9.1	5P/10.0	2P/6.0

20

OUT FALL NO.

A-119

APPENDIX H

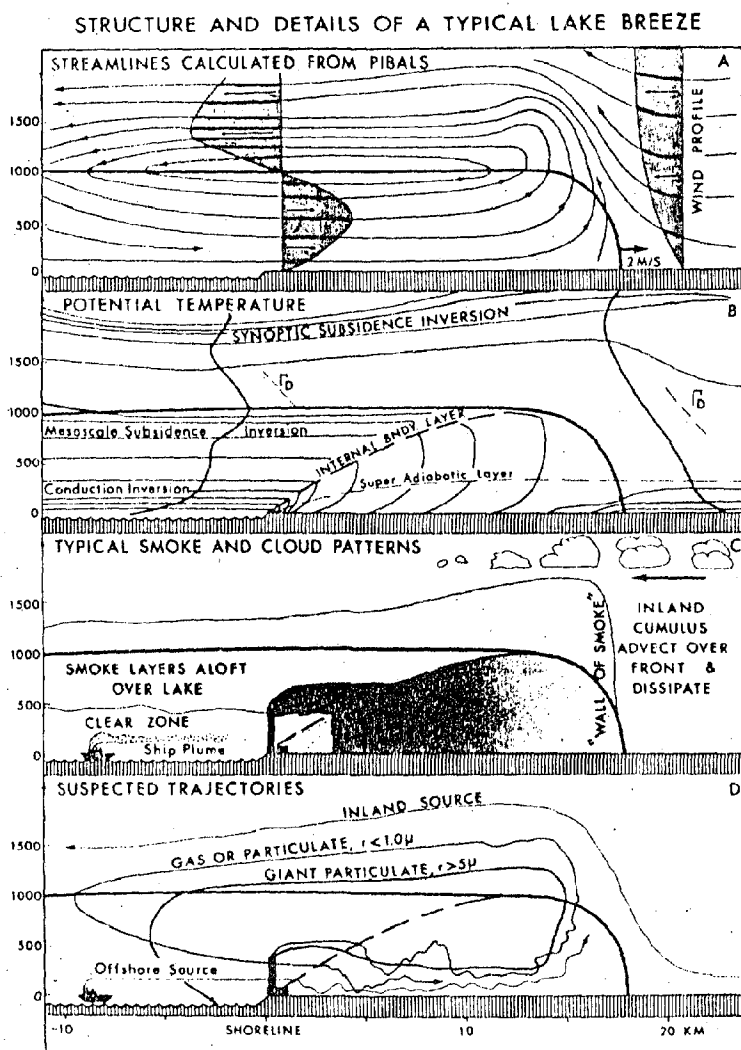
THE LAKE BREEZE AND AIR POLLUTION

The lake breeze in Northwest Indiana occurs mainly during the warm season daytime when the prevailing winds are light and the land is warmer than Lake Michigan. This type of circulation pattern is depicted in Figure 1. The low level inflow layer depth typically varies from 100 to 1000 meters, with 500 meters being about average, and can transport cool lake air as far as 40 km inland. Peak inflow wind speeds are as much as 6 to 8 m/sec and decrease with distance inland. The return flow layer aloft is typically twice the depth and half the peak wind speeds of the inflow layer.

In contrast to the very stable lake air due to cooling by the relatively cold lake water, the low level air over land exists as a turbulent boundary layer caused by solar heating. This internal boundary layer is found entirely within the inflow layer and increases in depth with distance from the lake. The outflow air aloft is generally quite stable as a result of the synoptic scale subsidence inversion.

The dispersion of tall stack emissions under these conditions is shown in Figure 2. (Lyons and Cole, 1972). A plume emitted into the stable onshore flow will be a fanning type with very little vertical or horizontal dispersion until it intersects the internal boundary layer at some distance downwind. At that point, the plume will be mixed rapidly downward through the boundary layer by turbulent eddies. Some of these pollutants will continue inland to the limit of the lake breeze circulation and urban heat island induced effects, and become caught in the return flow aloft. An amount of these pollutants can remain in the circulation regime, subside over the lake, get caught

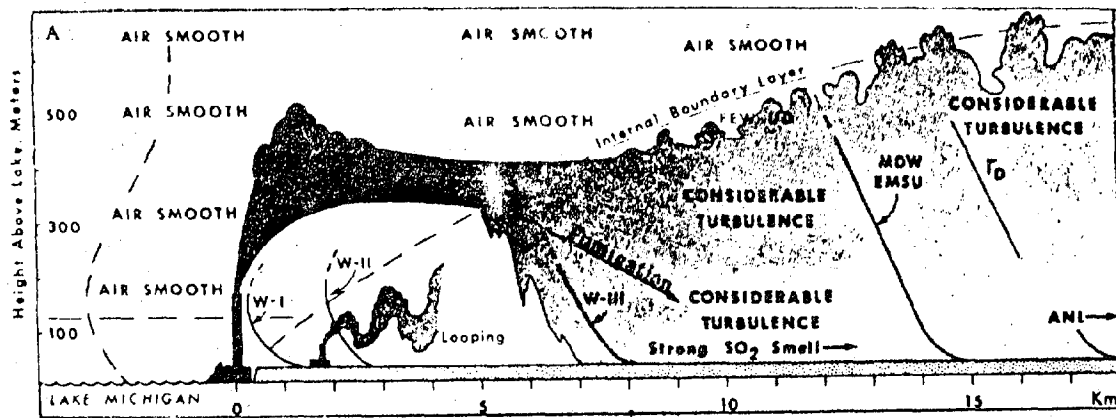
Figure 1



Schematic representation of the cross-sectional structure of a lake breeze cell and its effect on the diffusion and transport of pollutants. Heights are given in meters. The heavy solid line found in each diagram represents the mesoscale lake breeze front (Lyons 1971b). a) Streamline patterns calculated from pibals illustrate inflow and return flow layers, the convergence zone updraft and subsidence over the lake. b) Thermal structure: light solid lines are constant potential temperature. Over the lake, stability is indicated by an increase in potential temperature with height. Over the land, the internal boundary layer is defined by values of potential temperature that decrease or are constant with height. Temperature soundings are indicated by the solid dark lines. The lake sounding and lines of constant potential show three inversions. Over the land, a deep adiabatic boundary layer is overlain by a synoptic scale subsidence inversion. c) Smoke and cloud patterns associated with typical lake breeze cell. Shown is a ship's plume that would advect shoreward with little vertical diffusion until it crosses the shoreline into the turbulent boundary layer. The plume from a tall stack, initially emitted into stable air fumigates when it is intercepted by the building turbulent boundary layer. The diagram also shows a "wall of smoke" in the convergence zone and concentration of smoke aloft in the bottom of the return flow layer and in the upper portion of the inflow. d) Estimated trajectories of particles with different sizes and sources of origin. The effect of size sorting is discussed in the text.

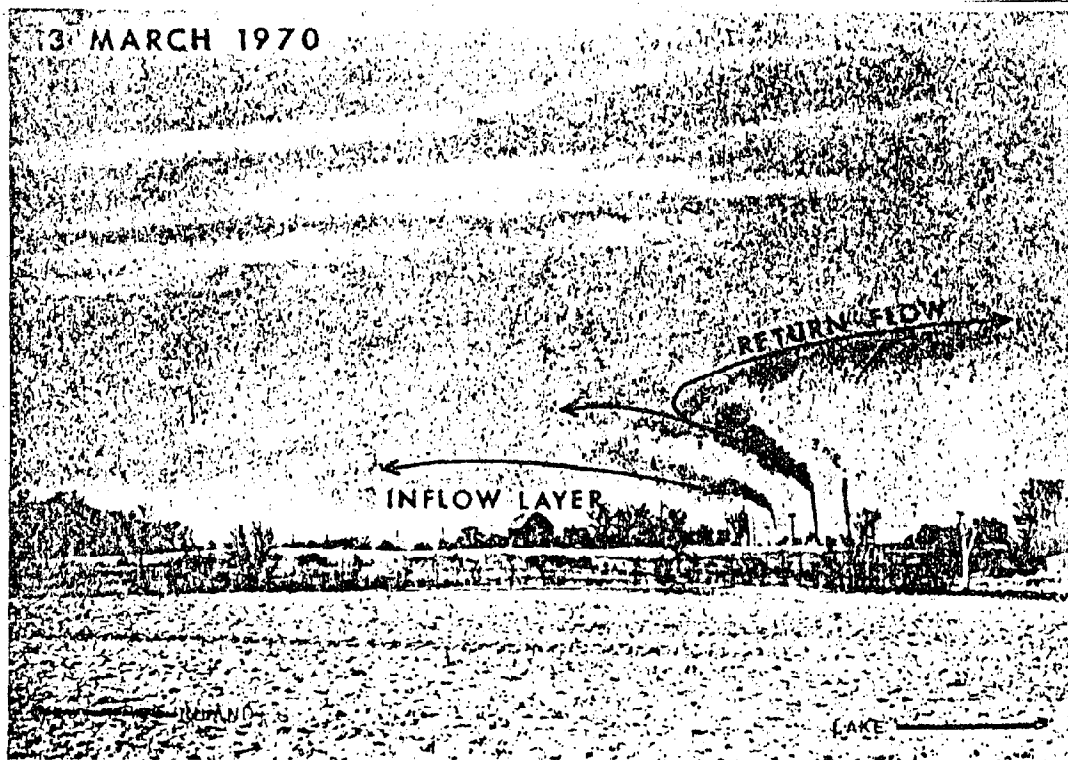
SOURCE: Enderson, William; Commonwealth Edison State Line Power Plant Probable One-Hour Worst Case SO₂ Concentrations; March 7, 1975

Figure 2



Schematic of observations during fumigation conditions on the western shore of the lake (looking south) around 1400 CST 25 June 1970. Plotted are the reports of turbulence encountered by the spotter aircraft, plus the approximate temperature profile over the water.

Figure 3



Smoke from a power plant 30 km south of Milwaukee at 1500 cst, Mar. 13, 1970, during a shallow lake breeze. Smoke from lower stack (195 m above lake level) is partially trapped in the inflow while part escapes into the return flow layer and spreads out over the lake to the east (right). Photograph by Tim Ondercin.

Source: Enderson, William; Commonwealth Edison State Line Power Plan Probable One-Hour Worst Case SO_2 Concentrations; March 7, 1975

again in the inflow, and enter the boundary layer a second time. For very tall stacks with high exit velocities or for very low mixing heights, it is possible for all or part of the plume to pass upward through the inflow layer and directly into the return flow aloft.

Figure 3 shows plume penetration into the return flow.

For a tall stack source located along a large lake, such as the Commonwealth Edison State Line power plant, this lake breeze/fumigation situation would probably yield the highest short-term (up to 12 hours) pollutant concentrations at a downwind receptor. The State Line plant is located on the Lake Michigan shore on the Indiana side of the Indiana-Illinois border. Here the shoreline is oriented basically northwest to southeast, and the normal lake breeze blows from the northeast. The plumes from the six stacks with heights ranging from 92 to 137 meters undergo fumigation during lake breeze conditions as described above. To determine the probable worst one-hour SO_2 concentration resulting from this plant, it is necessary to determine the concentration under lake breeze/fumigation conditions.

1. Lyons, Walter, A., and Henry S. Cole, 1972, "The impact of the Great Lakes on the air quality of urban shoreline areas; some practical applications with regard to air pollution control policy and environmental decision making". Proceedings of the 15th Conference on Great Lakes Research, International Association for Great Lakes Research, Ann Arbor, Michigan.
2. Lyons, Walter A., and Lars E. Olsson, 1973: Detailed mesometeorological studies of air pollution dispersion in the Chicago lake breeze. Monthly Weather Review, Vol. 101, 387-403.

